MEETING ABSTRACTS

115th Annual Meeting of the American Association of Colleges of Pharmacy, Grapevine, TX, July 26-30, 2014

BIOLOGICAL SCIENCES

Completed Research:

A Program to Foster Global Citizenship in Pharmacy Education. Ana Maria Castejon, Nova Southeastern University, Dawn Dacosta, Nova Southeastern University, Jaroslav Toth, Comenius University in Bratislava, Jan Kyselovic. Objectives: Understanding the practice of pharmacy from a global perspective is not a traditional curricular outcome in most US pharmacy programs. The objective of this Co-Curricular activity was to provide students with an understanding, and appreciation for pharmaceutical and medical practices outside the United States. A total of 35 student pharmacists participated in a Travel Study Program (TSP) to Slovakia during the summer of 2013 at Comenius University in Bratislava, Slovakia. Topics covered included pharmacognosy, molecular drug design, European pharmaceutical regulatory agencies and the practice of the profession in Slovakia and the European Union (EU). Live lectures, laboratory practices at the host institution together with multiple site visits to different professional practice settings were included in the TSP. Through reflective exercises we assessed the students’ ability to: 1. Compare the practice of pharmacy in the US versus Slovakia and the EU 2. Identify the professional benefits of attending a structured pharmacy TSP Method: The 35 students completed reflective academic assignments and cultural competency activities before and after the three-week visit to Bratislava. The students’ reflective exercises were analyzed using narrative and content analysis, allowing us to capture the multiple meanings and dimensions of the experiences. Results: The students’ narrations reflected a major impact on their professional growth, international awareness, appreciation for pharmaceutical and medical practices outside the United States. Students agreed that having a team exam prior to the individual exam made exams easier to take and helped them to prepare for the exams. Results did not identify any major disadvantages to holding a team exam. Implications: Developing global citizenship in pharmacy education can provide students with understanding of professional and cultural sensitivity and competencies. Participants identified major differences in legal and regulatory aspects of the profession. They highlighted the establishment of connections and international learning networks. Implications: We believe that these programs promote global citizenship, while fostering learning and cultural exchange within the pharmacy profession.

An In-Vitro Model of Intralipid Emulsion Treatment for Verapamil Toxicity. Wendell S. Akers, Lipscomb University, Kelli Ingram, Lipscomb University, Michael W. Fowler, Lipscomb University, Matthew Vergne, Lipscomb University, Bjorn C. Knollman, Vanderbilt University, Donna L. Seger, Vanderbilt University, Sheila P. Dawling, Aegis Sciences Corporation. Objectives: Recent animal research and human case studies highlight the potential use of intralipid emulsion (ILE) for the treatment of drug overdoses. The objective of this research project was to develop and validate an in vitro assay to determine the impact of ILE therapy on reducing free therapeutic and toxic verapamil concentrations and its active metabolite, norverapamil. Method: An in vitro model was developed using rapid equilibrium dialysis devices that allows free drug to dialyze across a semipermeable membrane. The cellulose membrane compartment is loaded with serum containing therapeutic (300 ng/ml) and toxic concentrations (5000 ng/ml) of verapamil and its active metabolite. After a 4 hour equilibration period, the serum compartment was treated with 1% ILE or phosphate buffered saline. Serum and dialysate compartments were sampled after 4 and 6 hours of treatment to quantify total and free drug concentrations by LC-MS/MS analysis. Results: Preincubation of serum containing verapamil or norverapamil with 1% ILE therapy reduced free drug concentrations by approximately 40-50% after a 4 hour incubation period (p < 0.05). Treatment of drug containing serum with 1% ILE therapy for 6 hours after establishing drug equilibration reduced free verapamil and norverapamil concentrations by approximately 20-30% (p < 0.05). Implications: Results from these studies allow us to predict the potential decrease in verapamil and norverapamil concentrations seen in overdose patients treated with ILE therapy, and potentially other lipophilic drug compounds. Application of these in vitro studies will also be extended into the clinical setting by measuring drug concentrations before and after ILE administration in overdose patients.

An Innovative Approach to Enhance Learning and Teaching by Incorporating Team-Exams into Team-Based-Learning. Parto Khansari, California Northstate University, Leanne Coyne, California Northstate University. Objectives: In formative assessment, students may fail to answer questions correctly due to lack of appropriate knowledge of the subject matter, failure to analyze the question critically, or failure to apply key concepts appropriately. The objective of this study was to evaluate whether implementing a team exam, similar to the midterm exams with the exception that answering questions is a team effort, offers any benefits to students. Method: In the study approved by CNUCOP IRB, students in the class of Pathophysiology and Pharmacology of the Cardiovascular System were scheduled to take three midterm exams and only two team exams. At the completion of the semester, students who agreed to participate in this study were asked to complete a survey that explored the benefits of these team exams. Results: Survey results showed that 100% of participants agreed that having a team exam prior to the individual exam made them feel more prepared. The most important findings of the study were that 97% of students believed that the team exam helped them to identify gaps in their knowledge and 85% agreed that taking a team exam reinforce their knowledge by teaching other students. The survey results did not identify any major disadvantages to holding a team exam. Implications: Implementing a team exam prior to midterm exams allows students to identify gaps in their knowledge, and strengthen their learning abilities through discussion and debate with their team.

Anti-Adipogenic Effects of Phytoestrogens Are Mediated via Antagonism of PPARγ. Julie Hall, Campbell University, Richard A. Everett, Campbell University, Hunter W. Ingoe, Campbell University, Jennifer L. Godwin, Campbell University, Kenneth S. Korach, NIEHS/NIH. Objectives: A compelling body of evidence has emerged suggesting that some naturally occurring plant chemicals, phytoestrogens, may offer protection against obesity. Interestingly, several dietary phytoestrogens are known to modify the activity of the peroxisome proliferator-activated receptor gamma (PPARγ), a key physiological regulator of adipogenesis. The objective of this study was to test the hypothesis that relative anti-obesity activities of different phytoestrogens reflect the ability of each agent to block the adipogenic actions of PPARγ. Method: Adipogenic effects of resveratrol and paliolid (phenolics), and genistein and daidzein (isoflavones) were examined using an adipogenesis differentiation assay. In parallel,
regulation of PPARγ target gene was measured by quantitative PCR. The agonist/antagonist activities of phytoestrogens on PPARγ were further assessed via their ability to effect recruitment of transcriptional cofactors to the receptor. Results: Resveratrol and pallolid displayed significant anti-adipogenic activities as exhibited by their ability to antagonize PPARγ-dependent adipocyte differentiation, up-regulate genes involved in lipid metabolism, block cofactor recruitment to PPARγ, and antagonize the effects of PPARγ agonist rosiglitazone. In contrast, isofoflavones functioned as PPARγ agonists, and likewise displayed pro-adipogenic activities. Implications: These data provide biological evidence that the pro- or anti-obesity effects of phytoestrogens are related to their relative agonist/antagonist activity on PPARγ. Thus, PPARγ activation assays may enable screening of dietary components and identification of agents with potential adipogenic activities.

Anticonvulsant Activity of Some Cyclohexenone Enaminones. Ivan O. Edafiogho, University of Saint Joseph, Mohamed Qaddoumi, Kuwait University, Kethireddy V. V. Ananthalakshmi, Kuwait University, Oludotun A. Phillips, Kuwait University Health Sciences Center, Samuel B. Kombian, Kuwait University. Objectives: The objectives of this study were to synthesize cyclohexenone enaminones and evaluate them in vitro for anticonvulsant activity. Enaminones are chemical compounds consisting of an amino group linked through a carbon-carbon double bond to a keto group. Method: Different structural analogs of cyclohexenone enaminones were synthesized and evaluated for actions on rat hippocampal neuronal excitation. We studied the effects of eight analogs AK1, AK2, AK6, AK7, E249, FA1, FA2, and FA4 on evoked population spikes (PS). Results: The effects of the cyclohexenone enaminones ranged from suppression of PS through no effect at all to enhancement in PS. The dichloro (AK1), and dibromo (AK6 and E249), derivatives having substituents on the cyclohexenone ring, suppressed PS amplitude in a concentration-dependent manner. AK6 (6-phenyl, 1-CO2Me) and E249 (6-methyl, 1-CO2Et) analogs had similar potencies, with EC50 values of 2.1 and 1.9 micromolar, respectively while AK1 (6-methyl, 1-CO2Et) was less potent with EC50 value of 10 micromolar. AK6 with a phenyl substituent on the cyclohexenone ring was more efficacious with a depression of 72% at 10 micromolar compared to 35% for E249 with methyl substituent. The analog (FA2: +35%) resulted in a proconvulsant compound. Implications: Our data indicate that not all enaminones are anticonvulsant at comparable concentrations and that the cyclohexenone ring is necessary for anticonvulsant activity, with the dibromo substituents being the most potent and efficacious derivatives for anticonvulsant activity. Supported by KURA grant #PR01/08.

Capsaicin Antagonizes Botulinum Neurotoxin A at the Motor Nerve Terminals. Baskaran Thyagarajan, University of Wisconsin, Objectives: Botulinum neurotoxin A (BoNT/A) selectively proteolyses SNAP-25 to inhibit acetylcholine (ACh) release and causes life-threatening neuroparalysis. BoNT/A is a potent bioweapon for which no antidotes are currently available. The objective of the work was to develop a novel antidote that counteracts the neurotoxin at the motor nerve terminals. Method: We used mouse model of localized paralysis caused by BoNT/A. We evaluated the prophylactic and therapeutic effects of capsaicin against BoNT/A. We also used in vitro two electrode voltage clamping technique to measure stimulus evoked acetylcholine in control and BoNT/A (≥ capsaicin) treated nerve preparations and immunocytochemical technique to analyze the subcellular distribution of proteins that mediate clathrin dependent endocytosis of BoNT/A. Results: Capsaicin, when injected post BoNT/A exposure, significantly accelerated recovery from neuroparalysis by restoring ACh release and muscle functions. Capsaicin treatment also decreased the total duration of paralysis by 50% and synergistically increased the effects of 3,4 diaminopyridine (blocks K+ channels and prolongs action potential) on ACh release measured by stimulus evoked twitch tension in BoNT/A poisoned nerve muscle preparations. Further, BoNT/A treatment, in vitro, decreased the expression of CaMKII and synapsin 1 (SYN1) and the phosphorylation of SYN1 in cholinergic Neuro 2a cells. Capsaicin treatment, post BoNT/A, reversed this. We hypothesize that at the MNT, capsaicin stimulated Ca2+ influx via TRPV1 triggers exocytosis by facilitating synaptic transmission via CaMKII mediated phosphorylation of SYN1. Implications: Our work will contribute for the development of TRPV1 as a novel target for neuroprotection against botulism and for other neurodegenerative diseases.

Current Status of Dual Degrees and Graduate Certificate Programs in US Colleges/Schools of Pharmacy. Mohammed A. Islam, West Coast University, Simi Gunaseelan, West Coast University, Rahmat M. Talukder, West Coast University, Seher A. Khan, Lake Erie College of Osteopathic Medicine. Objectives: With the ever-changing landscape of pharmacy profession, the US Pharmacy schools are offering alternative educational pathways to expand post-PharmD education such as dual degrees, specialty tracks, and graduate certification programs. The aim of this study is to assess the current status of dual or joint degrees as well as graduate certificate programs with PharmD in US Schools/Collages of Pharmacy. Method: An online assessment of the status of dual degrees was conducted in November 2013 by accessing AACP publication “Pharmacy Student Admission Requirements” and the websites of 127 Pharmacy Schools/Collages. The respective websites were visited, pages with pertinent information identified, retrieved, and analyzed. Results: Sixty three US Pharmacy Schools/ Colleges are offering 125 dual degrees for 2013-2014 academic year. The Master of Business Administration (MBA) constitutes 37% of the total dual degrees offered followed by Doctor of Philosophy (PhD) (23%), Master of Public Health (MPH) (21%), Master degrees in other areas of specialization (15%), and others (4%) including Juris Doctor (JD) and Doctor of Medicine (MD). PhD degrees are offered exclusively in pharmaceutical sciences. Admission requirements and curricular framework of the dual degrees vary among institutions. Completion of dual degrees requires additional 1-3 years depending on the program. Only 3 institutions offer joint PharmD/Graduate certificate programs in public health, ageing, and gerontology. Implications: Opportunities exist to expand dual degree programs in health system management, health informatics, public administration, pharmacy law, and medicine. Moreover, joint PharmD/graduate certificate program can serve as an alternative pathway of providing additional training and expertise.

Developing an Assessment Process for an MS in Pharmaceutical Sciences Program. Timothy I. Bloom, Campbell University, Michael L. Adams, Campbell University, Julie Hall, Campbell University, Thomas Holmes, Campbell University, Qinfeng Liu, Campbell University, William Stagner, Campbell University. Objectives: To develop an assessment process for an MS in Pharmaceutical Sciences program. Method: Program-level goals were developed by faculty responsible for each of the four subject areas in our program. These goals describe general areas of learning as students progress through the program. Each course director mapped his or her course learning objectives to the program goals, and suggested at which Bloom’s taxonomy level their course would prepare students. At the end of each semester, course directors developed tools for assessing each program goal that was addressed in their courses. Results from each assessment tool were then reviewed by the course director with the assessment.
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Theme: Enrichment of Sterile Technique Skills Through Introductory Pharmacy Experience

Objectives: To examine sterile technique and basic concepts of Chapter 797 among third-year pharmacy students.

Method: In 2012 and 2013, third-year pharmacy students, enrolled in a required Introductory Pharmacy Practice Experience, participated in a hands-on laboratory exercise designed to assess key elements of sterile compounding. Students completed two exercises: (1) modified low-risk compounded sterile product (CSP) media fill challenge test in a simulated ISO 5 environment, and (2) preparation of a 5 mg/mL solution of vancomycin from a 500 mg for injection vial.

Results: All students enrolled in the IPPE participated in and completed both exercises. During the media fill challenge, significant differences (p ≤ 0.05) between 2013 and 2012 were observed in four areas: hand washing, proper preparation of work area including cleaning the laminar flow hood, proper cleaning of supplies prior to manipulations and cleaning upon completion of the exercise. These differences may be attributable to implementation of a media fill simulation video in 2013. Greater than 90% of students in both years demonstrated proper technique when working within the hood, including placement of supplies and manipulations beyond the 6" line. Percent contamination of CSPs was less than 1% in both years. Also, the percent accuracy of the 5 mg/mL solution was within 15% of the targeted concentration for 96% of the solutions analyzed. Implications: Sterile compounding is delivered early in the PharmD curriculum and often not revisited. Reinforcement of sterile technique in advanced students allows for refinement of these skills before entering pharmacy practice.

Evaluating the Use of Interactive Whiteboard Technology in a Graduate Level Pharmacology Course

Objective: To investigate the effectiveness of interactive whiteboard technology in teaching a graduate level pharmacology course to Doctor of Pharmacy students.

Method: An interactive whiteboard was used during a two-lecture series of cholinergic agonists and antagonists to first-year Doctor of Pharmacy students (n = 84) taking Systems Pharmacology II. Throughout the lecture, review questions and activities were used to assess student understanding of the learning outcomes. Student survey forms were distributed at the conclusion of the second day of class. This voluntary and anonymous survey assessed student learning outcomes and students’ perceptions of the effectiveness of the interactive whiteboard technology and also allowed for open-ended comments. Results: Survey questions were evaluated using a Likert Scale (1 = strongly disagree; 5 = strongly agree). Sixty-seven students completed the survey, with one student leaving two questions blank. 69.7% of students agreed that after the lectures they were able to achieve the learning outcomes. 61.2% of students agreed that the teaching aids used were effective in improving student learning. However, only 33.3% of students preferred the use of interactive whiteboards over traditional lecture methods and only 38.8% of students agreed that they would like to be taught again using interactive whiteboards. Implications: Students found the whiteboards to be an effective teaching device when functioning properly and the use of interactive whiteboards had a positive impact on learning outcomes. However, most students reported that they preferred traditional lecture methods and expressed concerns about the room setup.

Evaluation of Off-label Transbuccal/sublingual Ketamine as a Rapid Acting Antidepressant by an Interprofessional Research Team

Objective: An interprofessional team comprised of a pharmacy, medical/graduate and nurse practitioner student was mentored by a basic scientist and clinicians to conduct a retrospective chart review of the off-label use of transbuccal/sublingual ketamine as a rapid acting antidepressant. Subanesthetic doses of ketamine can produce rapid and robust antidepressant actions within hours, but its widespread use is limited by an intravenous administration route, adverse events, and abuse potential. In an effort to overcome these limitations, off-label use of ketamine using an alternate transbuccal/sublingual administration route was piloted at Chestnut Ridge Center in treatment resistant patients, and the results were evaluated by the interprofessional team.

Method: Using retrospective chart reviews and prescription histories, the research team identified 17 patients who met the inclusion criteria for major depressive disorder and treatment resistance, who were additionally treated with subanesthetic doses of ketamine. Patient demographics, efficacy, side effects, and concurrent medications were

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Expanding the Role of Pharmacology Tutors through the Use of Online Quizzes. Melinda E. Lull, St. John Fisher College, Nicole Moore, Matthew Stryker, Jennifer L. Mathews, St. John Fisher College. Objectives: Pharmacology tutors have been available each semester for the past two years, but have been under-utilized by the student population. The primary objective of this study was to use innovative methods to increase the use of tutors in pharmacology courses. Method: Prior to the implementation of expanded services, tutors offered 3 office hours a week and group review sessions prior to exams. At the beginning of the spring semester, tutors altered their services to include 1.5 office hours, review sessions before every exam, and 1 hour of quiz preparation. Each week, a ten question quiz was prepared on the previous week’s material. Quizzes were made available through ExamSoft®, the software used for all pharmacology exams. Use of ExamSoft® also allowed students to experience questions in the same format as exams and track their progress. Students could take each quiz multiple times and were allowed to review each question. Data collected from the quizzes included: number of students taking each quiz, average quiz scores and performance on each question. Results: Implementation of online quizzes increased both face-to-face interactions with tutors and self-directed learning through tutor-provided materials. Participation in tutoring services increased from 1 per semester, to an average of 80 per exam. Exam and quiz questions were mapped to course learning outcomes and performance was compared, revealing improvements in performance between quizzes and exams (average improvement of 8%). Implications: Expanding the role of class tutors increased utilization of tutoring services, mainly through self-directed learning. The expanded role also benefited student performance on exams.

HU-331 Is a Redox-Dependent Inhibitor of Topoisomerase II. Kellie M. Regal, Lipscomb University, Susan L. Mercer, Lipscomb University, Joseph E. Deweese, Lipscomb University. Objectives: Topoisomerases are essential enzymes that are involved in DNA metabolism. Due to the double-stranded DNA cleavage mechanism, topoisomerase II is an effective target for anticancer drugs. We are examining a cannabinoid-based quinone HU-331 that does not promote cell death via apoptosis, cell cycle arrest, caspase activation, or DNA strand breaks. Our previous results demonstrate that HU-331 inhibits topoisomerase function by inhibiting the ATPase domain of the enzyme, however the compound also has other unique features, including the ability to inactivate the enzyme. Method: We employed biochemical assays to study the mechanism of action of HU-331 against purified topoisomerase II. These assays examined DNA binding, cleavage, ligation, and relaxation and ATPase function of topoisomerase II. Results: Our results demonstrate that HU-331 impacts both topoisomerase II-mediated DNA cleavage and relaxation. When added prior to the DNA substrate, HU-331 blocks DNA cleavage and relaxation activities of topoisomerase II. Further, the presence of dithiothreitol can prevent but not reverse this action by HU-331. Gel-based DNA binding assays indicate HU-331 reduces the ability of topoisomerase II to bind to DNA. Implications: Our results are consistent with a redox-dependent covalent mechanism for HU-331. The ability of HU-331 to impact DNA binding may explain how this ATPase inhibitor also impacts DNA cleavage. However, it is still unclear whether the ATPase inhibition is independent of the ability of HU-331 to inactivate the enzyme. Further studies are needed to clarify the mechanism of action and to determine the therapeutic potential of this compound.
Implementing a Student-Lead Supplemental Instruction (SI) Program for School of Pharmacy Basic Sciences Courses. Suzanne Clark, University of Wyoming, Greg A. Miller. Objectives: 1st year PharmD students (P1s) at Colleges/Schools of Pharmacy (SoPs), including transfers, can start with a wide range of academic backgrounds. If knowledge gaps exist, the rigor of P1 classes may prove insurmountable. The UWyo SoP aims to ameliorate these challenges, promote P1 academic success and progression, and also upperclass integration. This initiative is the first to incorporate UW Learning Resource network programs, including Supplemental Instruction (SI), a “proactive remediation” judged applicable to PharmD education (Maize, et al. AJPE, 2010). Method: SI PharmD student leaders were trained to target high-risk required courses (e.g., physiology). They provided regularly scheduled SI tutoring sessions, and incorporated inclusiveness and SI cognitive techniques. A 25-item IRB-approved survey was designed to measure participation, student assessment of SI, and suggestions for improvement. Results: 24 P1s participated; 11 P3 tutors facilitated sessions. Surveys were completed by 12 P1s and 6 P3s. All P1s would participate in SI if offered in future classes, all agreed/strongly agreed that they had opportunities to work with upperclassmen, 58% agreed/strongly agreed that SI helped them “...do better than expected.” (n = 10); 75% felt SI made them feel like “welcome members of the SoP student body”. All P3s “agreed/strongly agreed” that SI allowed opportunity to work with P1s and strengthened their own physiology knowledge; 83% felt the program helped them prepare for APPEs and, compared to previous years, SI increased association between P1s and upperclassmen. Implications: SI is a proactive approach that may improve retention and increase interclass mentoring.

Mechanisms of homologous and heterologous phosphorylation of the anti-inflammatory and anti-diabetic Free-Fatty Acid Receptor FFA4 (GPR120). Rebecca N. Burns, Mercer University, Monalisa Singh, Mercer University, Ilya S. Senatorow, Mercer University, Nader H. Moniri, Mercer University. Objectives: Free fatty acid receptor 4 (FFA4), previously known as GPR120, is a G protein-coupled receptor that promotes numerous anti-inflammatory and anti-diabetic effects upon its agonism by long chained unsaturated fatty acids, including the omega-3 fatty acids docosahexaenoic acid (DHA) and alpha-linoleic acid (ALA). We have previously demonstrated that agonism of FFA4 with DHA or ALA facilitates rapid and transient phosphorylation of FFA4, however, the precise mechanisms that promote FFA4 phosphorylation remain elusive. The goals of the current study were to characterize the mechanisms behind both heterologous and homologous phosphorylation of FFA4 and to identify the foci of FFA4 phosphorylation. Method: The current study makes use of whole-cell phosphorylation assays as well as Western blotting to assess the phosphorylation states and expression levels of FFA4. Functional characterization of wild-type and mutant FF4 was performed by fluorescent-phorylation assays as well as Western blotting to assess the phosphorylation. The current study makes use of whole-cell phosphorylation assays as well as Western blotting to assess the phosphorylation states and expression levels of FFA4. Functional characterization of wild-type and mutant FF4 was performed by fluorescent-phorylation assays as well as Western blotting to assess the phosphorylation. Results: Our data reveal that basal and heterologous phosphorylation of FFA4 are mediated by protein kinase C (PKC), while G protein-coupled receptor kinase 6 (GRK6) is the primary driver of agonist-mediated phosphorylation of FFA4. We also identify Thr347, Ser350, and Ser357 in the C-terminal tail as major sites of FFA4 phosphorylation. Mutation of these sites leads to altered FFA4 signaling to both G protein and arrestin linked cascades. Implications: Since many of the functionally beneficial anti-inflammatory and anti-diabetic effects of FFA4 are noted to be arrestin mediated, our findings could provide insight into the structural requirements for FFA4 function.

Molecular Dynamics Simulation Study of the Selective Molecular Permeation through Gap Junction Channels. Yun Luo, Western University of Health Sciences, Abdelaziz Alsamarah, Angelo R. Rossi, Dominic P. Purpura Department of Neuroscience, Albert Einstein College of Medicine, Andrew Harris, Department of Pharmacology & Physiology, New Jersey Medical School, Rutgers University. Objectives: Gap junction channels have long been thought to mediate molecular signaling between cells. Defects in those channels are responsible for human neuropathy and deafness, but the molecular mechanism has been unclear. Gap junctions are permeable to a wide variety of molecules. Functional studies have shown that channels formed by different connexins have different molecular selectivity mechanisms other than the size of the permeating molecule. In this study, Molecular Dynamics simulations are applied to study molecular permeation through connexin26 channel in order to investigate the molecular mechanism of selective permeation. Method: We applied an equilibrium method (Umbrella Sampling Replica Exchange) to explore the free energy profile of two aminopyridyl-labeled saccharides in the connexin26 (Cx26) pore, one of which is permeant and one impermeant, as shown by experiment. The system is an MD-equilibrated Cx26 channel, in explicit membrane/solvent, that incorporates key post-translational charge changes and has been shown by Brownian Dynamics to reproduce the electrical conductance characteristics of the native channel. Results: The results show energy profiles that are consistent with experimental results. The permeant has only moderate energy barriers to overcome, while there is a substantial barrier to movement of the impermeant through the pore. Potential sites of interaction within the pore are defined for each molecule. Implications: The qualitative correspondence between calculated energy profiles and experimental data for a permeant and a nonpermeant molecule suggests that this system can be used to explore the molecular basis by which connexin channels select among potential permeating molecules, and how mutations alter the permeation process.

P-Glycoprotein Inhibition Sensitizes Breast Cancer Cells to Proteasome Inhibitors. Rahul R. Deshmukh, Qingping Dou, Wayne State University. Objectives: The proteasome inhibitors have shown limited efficacy in solid tumors including triple negative breast cancer (TNBC). Absence of specific therapeutic targets makes TNBC difficult to treat. Since chemotherapy is the only option, development of new therapeutic strategies to treat TNBC has been warranted. Method: MTT assay was used to determine the inhibition of cell proliferation after treatment with test drugs or combinations. Changes in the accumulation of ubiquitinated proteins, proteasome substrate proteins and cleaved poly(ADP-Ribose) Polymerase (PARP) after each treatment were determined by immunoblotting. Proteasome activity assays were performed using fluorogenic peptide substrates. Results: The combination of verapamil, a P-glycoprotein (P-gp) inhibitor, and bortezomib, a proteasome inhibitor showed enhanced cytotoxic effect in TNBC MDAMB231 cells. Verapamil improved proteasome-inhibitory properties of bortezomib as shown by the increased accumulation of bortezomib.
of ubiquitinated proteins and proteasome substrates such as IκBα and p27kip1. The co-treatment of bortezomib and verapamil also resulted in cancer cell apoptosis. Combination of verapamil with carfilzomib, a second generation proteasome inhibitor, gave similar enhanced cytotoxic effects. Verapamil itself at higher concentrations was able to inhibit the chymotrypsin (CT) and peptidyl glutamyl peptide hydrolyzing (PGPH)-like activities in the purified 20S proteasome as well as in a MDAMB231 cell extract. The combination of carfilzomib, another P-gp inhibitor, with bortezomib or carfilzomib also led to a significant inhibition of MDAMB231 cell proliferation. **Implications:** These findings indicate that P-gp inhibitors such as verapamil and carfilzomib could sensitize TNBC cells to structurally and functionally diverse proteasome inhibitors and might provide new treatment strategy for TNBC.

**Phosphodiesterase mRNA Expression Changes Seen During C2C12 Differentiation.** Timothy J. Bloom, Campbell University, Srinath Kashi Ranganath. **Objectives:** The second messenger cAMP activity during differentiation may increase in order to keep cAMP levels low. The work described examines changes in mRNA expression of PDE isoforms during differentiation of C2C12 myoblasts into myotubes. **Method:** Cells were maintained on 100 mm culture plates in 10% fetal bovine serum in Dulbecco’s Modified Eagle Medium (DMEM) and differentiated using 10% equine serum in DMEM. Tritol reagent (Ambion) was used for isolating RNA following the manufacturer’s protocol. First strand cDNA was synthesized from RNA using the qScript™ cDNA synthesis kit (Quanta Biosciences). A set of intron-spanning primers were designed using Primer-Blast to amplify all variants of a PDE isoform for each isoform expressed in mouse. End-point PCR was used to amplify targets, which were analyzed for quantity by densitometry. GAPDH was used as a normalizing control. **Results:** Targets representing eleven isoforms from seven PDE families (PDE2, 3, 4, 5, 7, 8 and 10) were amplified from cDNA made from C2C12 mRNA. Two isoforms (PDE3B and PDE10A) showed decreases of almost 50% while one isoform (PDE2A) showed a nearly seven-fold increase in mRNA expression. **Implications:** Although mRNA expression of several PDEs is seen in C2C12 cells, only one isoform is seen to have a dramatic increase during differentiation from myoblasts to myotubes, when cAMP levels need to be kept low. This implies a limited compartment of cAMP regulates this differentiation.

**Pilot Project Comparing Interprofessional Education via Asynchronous Online Discussion and Synchronous Video Meeting.** Teresa M. Seeffldt, South Dakota State University, Jane R. Mort, South Dakota State University, Randi A. Sayles, South Dakota State University, Barbara Brockevelt, University of South Dakota, Jarod Giger, University of South Dakota, Becca Jordre, University of South Dakota, Kendra Kattelmann, South Dakota State University, Michael Lawler, University of South Dakota, Jay Memmott, University of South Dakota, Wade Nilson, University of South Dakota. **Objectives:** To compare student perceptions of interprofessional patient case discussions conducted via asynchronous online discussion to synchronous discussions held via video meeting. **Method:** Pharmacy, nursing, dietetics, physician assistant, physical therapy, occupational therapy, and social work students participated in the pilot project and were divided into two groups. The first group conducted discussion of a case study using a message board in a learning management system. The second group discussed the same case study via synchronous video meeting. Students completed a post-activity survey to provide feedback on the activity. **Results:** Students in both groups felt that the technology was an effective method of conducting interprofessional case discussions. More students in the synchronous discussion group felt that their teams functioned well compared to the asynchronous group (80% agreed in synchronous group compared to 63% in asynchronous). The students participating in the video meetings also felt that the activities would better prepare them for future interprofessional education activities (84% compared to 69%) and for participation on a healthcare team (88% compared to 73%). However, the discussion board was reported to be easier to use; 79% reported that the discussion board was easy to use compared to 60% using the video technology. The most common technological problems with the video conferencing were audio and video issues. **Implications:** Students felt that synchronous video meetings had improved team function and better prepared them for future interprofessional activities compared to use of an asynchronous discussion board. Technology may serve as an effective tool for providing interprofessional experiences for students separated geographically.

**Preparation of Individual Nucleosomes for Analysis of DNA-histone Interactions using Nanopores.** Andrey Ivankin, Meni Wanunu, Northeastern University, Department of Physics and Chemistry/Chemical Biology, Shannon R. Kinney, Western New England University. **Objectives:** In Eukaryotic organisms, DNA exists in a chromatin complex made up of nucleosome subunits. A nucleosome consists of ~147 base pairs of DNA wrapped around a histone octamer. A myriad of DNA and histone modifications are thought to play a role in DNA-histone interactions, altering chromatin structure and function. The current study describes a method to prepare nucleosomes containing DNA with various lengths, sequences, and modifications in order to assess how this alters the strength of DNA-histone interactions. **Method:** Purified recombinant histone proteins were purchased. DNA of various sequences and lengths were purchased or produced by polymerase chain reaction (PCR) and methylated by M. SsoI bacterial methylase. DNA was purified by PCR purification column, eluted in water, lyophilized, and resuspended at the appropriate concentrations. Nucleosomes were assembled through dilution of NaCl concentration of DNA-histone mixtures. **Results:** Optimization of DNA construction is essential for successful nucleosome assembly. Quantification of DNA must be exact as the molar ratio of DNA to histone proteins is significant. Thus, DNA was purified with a column, to ensure complete removal of free nucleotides and primers. In addition, lyophilization and resuspension of DNA at appropriate concentrations was necessary to obtain the very high amounts of DNA (>1000 nanograms/microliter) required to maintain appropriate molar ratios. **Implications:** Nucleosomes assembled with these DNAs have worked well for nanopore analysis, allowing us to examine DNA-histone interactions in various scenarios. Future work will focus on preparation of nucleosomes containing histone modifications. These modified nucleosomes could be used in a number of applications to study chromatin function.

**Preparing Students For An Accelerated PharmD Program at Sullivan.** Maria Lourdes Ceballos-Coronel, Sullivan University, Kimberly K. Daugherty, Sullivan University. **Objectives:** To determine if refresher/preparatory courses lead to higher chances of success in future PharmD coursework in an accelerated PharmD program. **Method:** Refresher courses in Biochemistry, Calculations, Anatomy & Physiology, Organic Chemistry, Pharmacology, Microbiology and Immunology were offered over 2 weeks to incoming first year professional students. Data includes total registrants, number of courses taken and name of courses for graduating Classes 2013-2016. This
study was to determine if refresher courses lead to higher chances of success in PharmD core courses. Academic success or failure was compared utilizing the class averages and the number of course failures between refresher course takers and the non-takers. Results: Refresher course registrants were 17 % (n=92) for Class 2013, 7 % (n=104) for Class 2014, 10 % (n=110) for Class 2015 and 9 % (n=103) for Class 2016. Refresher courses most attended were Biochemistry, Pharmacology and Calculations. Course averages for the most attended courses for takers versus non-takers are as follows: Biochemistry (79.8%/86%), Calculations (88.4%/87.99%), p<0.05, and Pharmacology (83.3%/86.89%, p<0.05). Course failures were also reviewed for the most commonly taken courses. Course failures for the takers versus non-takers are as follows: (Biochemistry (3/12), Calculations (0/17), and Pharmacology (2/3). Implications: While course averages showed higher results solely for Calculations among refresher course takers, the overall number of course failures were lower in comparison with the non-takers. Refresher or preparatory courses offers an opportunity for students to review concepts and prepare them for the rigors of an accelerated program especially in pharmaceutical calculations.

Re-positioning FDA Approved Drugs for Molecular Investigation in Pancreatic Adenocarcinoma: Search for Novel Therapeutic Targets. Ashim Malhotra, Pacific University Oregon, Parmbir Kahlon, Pacific University Oregon. Objectives: Pancreatic cancer is an aggressive disease. Treatment options are limited because knowledge of potential drug targets is lacking. Additionally, the role of estrogenic hormones in the tumor microenvironment on disease progression is obscured. In the present study, our overall objective was to treat the human pancreatic cancer cell line Mia PaCa-2 with raloxifene to identify novel molecular therapeutic targets. Raloxifene is a Selective Estrogen Receptor Modulator (SERM) approved by the FDA for treatment of osteoporosis. Structurally similar SERM drugs, such as ormeloxifene, have been reported to evince strong antineoplastic properties. Method: We conducted dose-response cytotoxicity experiments, treating Mia PaCa-2 cells at 80% confluency with different concentrations of raloxifene, using the resazurin fluorescent dye assay as a read-out for cell viability. Results: Our experiments demonstrate that the LD50 for raloxifene is 10 μM. We conducted a Western Blot analysis of Mia PaCa-2 whole cell lysate, using mouse monoclonal Estrogen Receptor β (ERB) antibody and report the presence of ERB in Mia PaCa-2 cells, which is required for raloxifene activity. Subsequently, using mouse monoclonal antibodies, we investigated the effects of raloxifene treatment on proteins involved in the development of pancreatic cancer. Western Blot data demonstrate altered total protein amounts of the oncogene product k-ras, tumor suppressor proteins p53 and smad4, and the hyperproliferation marker Ki67 in whole cell lysates of raloxifene-treated Mia PaCa-2 cells versus untreated control. Implications: Our data suggest the possibility of “re-positioning” FDA approved drugs, such as raloxifene, for novel use in the treatment of pancreatic cancer.

Role of DNA Methylation in Regulation of Calcium Homeostasis in HCT116 Colon Cancer Cell Line. Jeffrey Rovatti, Western New England University, Alexander Wu, Western New England University, Shannon R. Kinney, Western New England University, Diptiman Bose, Western New England University. Objectives: Calcium (Ca2+) is a ubiquitous second messenger regulating a myriad of cellular processes. Increased cytosolic Ca2+ activates apoptosis and is cytotoxic. Epigenetic modifications, such as DNA methylation, play a major role in transcriptional gene regulation. The link between epigenetics and Ca2+ signaling is not clear, in either normal or disease states, such as cancer. To determine this relationship, we measured differences in Ca2+ handling between the colon cancer cell line (HCT116) and a double knockout of DNA methyltransferases 1 and 3b HCT116-DKO. Method: Thapsigargin (TG)-mediated cytotoxicity was measured using MTS assay. Changes in intracellular Ca2+ were studied using fluorescence based Live-cell Ca2+ imaging. Gene expression was determined using qRT-PCR. Results: Incubation of HCT116 with TG, a sarcoplasmic endoplasmic reticulum Ca-ATPase (SERCA) pump inhibitor, resulted in a concentration-dependent decrease in cell viability. Interestingly, HCT116-DKO cells were clearly resistant to TG-induced cytotoxicity. To explain the differences in cytotoxicity ER Ca2+ store capacity, Fluo-4AM loaded HCT-116 and DKO cells were challenged with TG (5μM and 10μM). Addition of TG, mobilized an increase in cytosolic Ca2+ in both cell lines. The amplitude of Ca2+ transient in the HCT116 was 30% higher than in DKO cells. This could be explained by altered levels of Ca2+ regulatory genes, such as ORAI, STIM, SERCA, and TRP. Increased ORAI2 expression was observed in HCT116-DKO as compared to HCT116 cells. Implications: These results indicate that epigenetic mechanisms may be responsible for conferring the resistance of HCT116-DKO cells to TG mediated cytotoxicity, suggesting the possible role of DNA methylation in regulating calcium signaling events.

Salinomycin Suppresses PDGFRβ, c-Myc, and Notch Signaling in Human Medulloblastoma. Shuang Zhou, Fengfei Wang, Ying Zhang, Max Johnson, Min Wu, Erxi Wu, North Dakota State University. Objectives: Medulloblastoma (MB) is the most common childhood brain tumor with poor prognosis and dismal survival rate. More effective therapeutic approaches are sorely needed. We and others have shown that overexpression of either PDGFRβ or c-Myc in patients with MB indicates a poor outcome suggesting these two molecules as critical therapeutic targets in MB. In addition, the importance of Notch signaling in MB progression and MB stem cell maintenance were also uncovered in recent years. The objective of this study is to test if salinomycin, an anti-coccidial drug with profound cytotoxicity against breast cancer stem cells, suppresses PDGFRβ, c-Myc, and Notch Signaling in MB cells Method: We used MTS assay to demonstrate the cell proliferation and employed flow cytometry to analyze the cell cycle. Furthermore we used Western blotting analysis and RT-PCR to evaluate the protein and gene expression levels. Results: Here we show that salinomycin inhibits cell proliferation, induces cell death and cell cycle arrest at G2 phase in MB cells. We further revealed that salinomycin up-regulated the expression of cyclin A and down-regulated the expression of p21 and Bcl-2. More importantly, it inhibits the expression of two potential therapeutic target proteins, c-Myc and PDGFRβ, and suppresses the expression of some key molecules in Notch signaling pathway in MB cells. Implications: Our data shed light on the potential of using salinomycin as a novel therapeutic agent to treat patients with MB.

Sterile Compounding Laboratory and Experiential Training: Perceptions by Students of Skills Proficiency and Practice Relevance. Anna Ratka, Chicago State University, Brenda Bowden, Chicago State University, Kyle Walker, Chicago State University, Miriam A. Mobley Smith, Chicago State University, Barbara Limburg-Mancini, Chicago State University, Michael Danquah, Chicago State University. Objectives: The objectives of this project were to characterize the effects of sequential laboratory and experiential training on students’ perception of: (1) their proficiency in practical skills essential in sterile compounding, and (2) the importance of these skills for pharmacists. Method: Second year student pharmacists enrolled in a required 2-credit laboratory course on sterile dosage forms participated in this
study. A Likert scale survey addressing 25 skills related to sterile compounding was developed. Survey was administered pre- and post-laboratory course and one semester later at the end of the institutional IPPE rotation. Preceptors were administered the same survey to rate students’ proficiency in sterile compounding at their practice site. **Results:** The preliminary analysis of findings showed that during the laboratory training, the overall proficiency reported by students changed from 2.60+/-0.47 to 4.27+/-0.30 points pre- and post-course, respectively. The change in perception increased at least 2 points for seven skills. The average change for 25 skills was 1.68+/-0.40 points. Pre- and post-lab overall ranking of importance of skills changed from 4.68+/-0.06 to 4.83+/-0.03. **Implications:** The findings from this project can guide curricular assessment of: students’ achievement of laboratory learning outcomes; the effectiveness of laboratory teaching methods on sterile compounding proficiency; student perceptions of relevance of these skills in contemporary pharmacy practice; and student application of sterile compounding skills in an institutional setting.

**Survey of Lesbian, Gay, Bisexual and Transgender Inclusion:** **Curricular Coverage in Colleges/Schools of Pharmacy.** Jennifer L. Mathews, St. John Fisher College, Amy L. Parkhill, St. John Fisher College, Anita Jackson, The University of Rhode Island, Kelly L. Matson, The University of Rhode Island. **Objectives:** To quantify the curricular coverage of topics related to LGBT healthcare in pharmacy schools nationwide. **Method:** An anonymous, electronic survey was sent to administrators at 130 pharmacy schools. The survey tool was created by Obedin-Maliver et. al and asked questions related to curricular coverage of topics related to LGBT healthcare in pharmacy schools nationwide. **Results:** Forty-four survey responses were received (33.8% response rate) with all National Association of Boards of Pharmacy districts represented.Forty-four survey responses were received (33.8% response rate) with all National Association of Boards of Pharmacy districts represented. Survey responses indicated that only 8% of programs had LGBT-specific content in the required preclinical curriculum and when it was included, 96% of programs identified that the time spent on these topics was between 0-10 hours. Respondents were asked to give an opinion on the density of coverage of LGBT topics at their institution, 40% responded very poor/poor. Only 8% of schools had a clinical clerkship specifically related to LGBT healthcare. When asked to identify content areas covered in the required curriculum related to LGBT patients, safe sex (45.2%); sexually transmitted infections (40.0%); and HIV (60.7%) were the primary focus. Topics that specifically address transgender healthcare, gender identity (20.0%), transitioning (6.7%), and sex reassignment surgery (6.5%), had the lowest coverage. Of the schools responding, 44.8% indicated that their programs gave students an opportunity to practice the use of inclusive language and interviewing techniques. Content addressing barriers to healthcare in LGBT patients was required in 25.8% of programs. **Implications:** Pharmacy schools are lacking in curricular content and time spent on topics related LGBT healthcare.

**The Emerging Microbe Project: Synthesis of Pathogen Identification and a Clinical Infectious Disease Case Study.** Lauren A. O’Donnell, Duquesne University, Dane’t Douu, Duquesne University, Michael W. Perry, Duquesne University. **Objectives:** The objective of this study was to design an interdisciplinary project that would integrate fundamental microbiology with clinical research and decision-making skills. **Method:** The project guided students (n=309) through patient cases from the first stages of microbe identification via sequence analysis to defending a therapeutic strategy for an infected patient. We hypothesized that students would develop a better understanding of how microbiology fit into clinical practice and gain confidence and skill in independently selecting anti-microbial therapies for a new disease state. Students were assigned the project in the first semester of an infectious disease class (PY2). **Results:** We demonstrate that the Emerging Microbe Project significantly improved student learning through multiple assessment strategies (care plans, exam questions) and increased student confidence in clinical infectious disease skills (pre- and post-assessment surveys). Students reported increased confidence in all skill areas tested, and demonstrated mastery of learning objectives by case study grades and improved exam scores (p<0.001). **Implications:** There are publications on the use of genomic sequence analysis in microbiology courses, our project is the first to link an unknown pathogen to a report on medically relevant information for a health care provider and to a case study of a patient infected with that microorganism. The students were not only responsible for explaining a new microorganism, but also for choosing the most appropriate antimicrobial therapy and supportive care for the patient. This project is one mechanism by which students can develop the necessary independence and proficiency for a successful pharmacy career.

**The Use of Student Development Workshops to Supplement the Traditional Pharmacy Curriculum.** Melinda E. Lull, St. John Fisher College, Jennifer L. Mathews, St. John Fisher College. **Objectives:** Preparing students to be successful in the classroom and as practitioners requires more than didactic education. The objectives of this study were to develop and assess a series of student development workshops aimed at addressing supplementary professional and academic needs of pharmacy students. **Method:** Over the course of an academic year, three student development workshops were planned and presented. Based on observed student needs, workshop topics offered were learning styles, time management, and test taking strategies. Each workshop was presented by a different group of faculty members, with participation of content experts from outside of the school of pharmacy. Interactive activities were incorporated into each workshop. After each workshop, students were surveyed on the usefulness of the session, likelihood of using the tools presented, and accomplishment of each of the workshop-specific learning objectives using a Likert scale of 1-5 (1 = strongly disagree; 5 = strongly agree). **Results:** Average attendance at the workshops was 60 students (19% of the student population). Student perceptions of the workshop were overwhelmingly positive, with an average of 90% of students agreeing or strongly agreeing that the sessions were beneficial and pertinent to their academic performance. Accomplishment of the session learning objectives was also high, with an average of 81% of students agreeing or strongly agreeing that each learning objective had been met. A majority of students (77%) planned to implement the tools presented at the sessions. **Implications:** Identifying and addressing the professional needs of pharmacy students provides a supplemental education that enhances the classroom experience and academic success.

**Using Etoposide Resistant Mutants to Characterize Etoposide Quinone.** Elizabeth G. Gibson, Lipscomb University, Susan L. Mercer, Lipscomb University, Joseph E. Deweese, Lipscomb University. **Objectives:** Topoisomerases are abundant nuclear enzymes that regulate DNA topology and remove knots and tangles in the genetic material by employing a double-stranded DNA cleavage mechanism. While the anticancer agent etoposide is highly effective at inducing topoisomerase II-mediated DNA damage, etoposide is also metabolized into a catechol and a highly active quinone. The quinone metabolite has the ability to act covalently, and we have employed etoposide resistant mutants to assist in clarifying the site(s) of action of the quinone. **Method:** We used topoisomerase II structural evidence to
Wilderness Medicine: Expanding the Horizons of Pharmaceutical Science Elective Courses. Emily R. Esposito, Sullivan University, T. Sean Boyle, Sullivan University, Maria Lourdes Ceballos-Coronal, Sullivan University, David B. Cleary, Sullivan University, Ajoy Koomer, Sullivan University, Gopalakrishna Pillai, Sullivan University, Michael L. Smith, Sullivan University, Yuan Zhao, Sullivan University. Objectives: To evaluate the impact of an innovative team-taught elective course focusing on the application of medicine and pharmacy in the wilderness. Method: With increased public interest regarding wilderness activities over the past few decades, pharmacists today require knowledge and skills related to wilderness medicine. This elective was envisioned to provide a quick and decisive approach to manage outdoor medical emergencies while introducing topics that integrated pharmaceutical sciences (PS) faculty areas of expertise (calculations, pharmacology, medicinal chemistry, physiology, biochemistry, and immunology). This elective was offered to 2nd year Pharm D students in an accelerated program and focused on active learning skills (bandaging and taping, wilderness hike, medicinal plant identification and emergency survival demonstration). Validation of didactic and active learning skills was through written assessments. There were two tests, a final exam, and quizzes. Quizzes focused on skills learned in class such as proper application of bandages, tapes, and splints in injuries and identification of local plants. Additionally, students were asked to complete a survey to evaluate the significance of the course and student confidence. Results: At the conclusion of the course, over 70% of the students strongly agree that the hands on and group learning contributed to individual learning of a specific topic. Additionally, they felt integration of the topics was creative and innovative approach to teaching. Implications: By introducing the topic of wilderness medicine to the pharmacy student, we prepare the next generation of healthcare professionals with awareness of potential hazards and remedies in the wilderness and suggest a niche for continuing education courses for community pharmacists.

Zerumbone. A Phytochemical Significantly Inhibits Cell Division and Migration of Pancreatic Cancer Cells. Arup Chakraborty, Roseman University of Health Sciences, Jessica E. Jorvig, Roseman University of Health Sciences, Bach Ha, Roseman University of Health Sciences, Qian Qian. Objectives: Zerumbone is a sesquiterpene isolated from Zingiber Zerumbate, a common dietary component in south-east Asia. Our goal is to delineate the mechanism of action of zerumbone in pancreatic cancer. Method: The following methods were used during experimentation: RT-PCR for mRNA expression; western blot for protein expression; wound healing assay and boyden chamber for cell migration; and Guava flow cytometer for cell cycle and apoptosis assay. Results: MiaPaCa 2 and Panc 1 are two aggressive pancreatic cancer cell lines also insensitive to gemcitabine. We have reported previously that zerumbone specifically inhibits onco-genic JAK/STAT signaling pathway leading to inhibition of proliferation of these cells within 12 hrs of incubation. We now report that inhibition of the JAK/STAT pathway by zerumbone leads to inhibition of major promigratory and cell cycle genes within 12 hrs. As a result, pancreatic cancer cell migration was completely blocked and cell division was restricted at G0 stage. Interestingly, apoptosis was triggered after 72 hrs of incubation with zerumbone. Similar effects were also observed when cells were treated with Stat3 specific inhibitor static, to confirm the role of JAK/STAT signaling in cell division arrest and anti-metastatic activity. Implications: Zerumbone comes from common dietary source with minimal side effect in murine model. Zerumbone significantly blocked major pro-metastatic and cell cycle regulator genes expression in pancreatic cancer cells and as a result inhibited cell proliferation and migration. Current study suggests that Zerumbone has a potential to be used as a therapeutic agent in pancreatic cancer.

Theoretical Models:

Comparing Pharmacy Education and Practice in Iraq and the United States. Kifaia Hassan, Pacific University Oregon, Fawzy A. Elbarbry, Pacific University Oregon, Brendan D. Stamper, Pacific University Oregon. Objectives: The role of a pharmacist varies among different countries throughout the world due to numerous factors and specific needs related to pharmaceutical care. This work investigates the differences in how pharmacy education and practice has evolved in Iraq compared to the United States. Method: Data for this comparative study was collected by Kifaia Hassan, a pharmacy student at Pacific University, who spent three months as a pharmacy volunteer and intern in Iraq. This work focused on identifying observable differences in (1) pharmacy education, (2) pharmacy curriculum, and (3) job opportunities, and (4) pharmacy practice between the two countries. Results: This study identified two key differences regarding pharmacy education and practice in Iraq and the United States. First, necessity and limited resources have driven innovative practice and an expansion in the role and responsibilities of a pharmacist in Iraq. Second, thoughtful oversight and a strong regulatory framework promote an effective pharmacy profession, both of which are limited in Iraq. This deficiency is due to personnel shortages, a weak infrastructure, and the presence of unlicensed street vendors. Implications: Over the past decade, Iraq has endured governmental instability based on many well-documented historical events. This history has directly impacted all aspects of life in Iraq including pharmacy. Comparing pharmacy education and practice in the United States with how it has evolved in Iraq under these circumstances provides valuable lessons for American pharmacists regarding regulatory importance and the power of innovative practice.

CHEMISTRY

Completed Research:

Abandoned Coal Mines: A New Source of Bioactive Natural Products. Madan K. Kharel, University of Maryland Eastern Shore, Xiachang Wang, Khaled A. Shaaban, Sherif I. Elshahawi, Larissa V. Ponomareva, Shanteri Singh, University of Kentucky, Manjula Sunkara, Division of Cardiovascular Medicine, University of Kentucky, James C. Hower, Center for Applied Energy Research, University of Kentucky, Andres J. Morris, Division of Cardiovascular Medicine, University of Kentucky, Jon S. Thorson, University of Kentucky. Objectives: The objective of this project was to assess the secondary
metabolites of soil actinomycetes isolated from the unique ecological environments created by years-long fires of abandoned mines in the Appalachian mountains of Kentucky. **Method:** Actinobacterial species were isolated from soil samples collected from the thermal vents of actively burning/inactive abandoned coal mines. Fermentation extract of the corresponding isolates were subjected to LC-HR-MS analyses and biological activity evaluation to identify novel/new metabolite producer species. With the aid of natural products database (AntiBase 2012), bacterial strains were selected based on the uniqueness of the secondary metabolites in the corresponding extracts. Selected strains were subjected to large scale fermentation for the production of secondary metabolites. Various chromatographic techniques were used to isolate and purify compounds. Structures of the new compounds were elucidated using HR-MS and 1D and 2D-NMR techniques. **Results:** Over 500 actinobacterial species were isolated from the soil samples collected from Ruth Mullin, Truman Shepherd, Lots Creek, and Acid Drainage sites of Kentucky. Fermentation of four selected strains led to the isolation of a half dozen of structurally diverse new natural products including ansamycins, terpenoids, macrolides, and aromatic polyketides. In addition, a novel natural product ruthmycin was also isolated and characterized. Newly isolated molecules displayed a wide-range of biological activities. **Implications:** Abandoned coal mines within Appalachian range of Kentucky provide an excellent resource for the unique actinobacterial species. Co-evolution of bacterial secondary metabolites with decade long local environmental change may be valuable for the isolation of yet unprecedented natural products/drug-leads.

**An Evaluation of Cost versus Quality in Green Tea Dietary Supplements.** Cindy Arocena, Chicago State University, Nancy Elsharkawy, Ehab A. Abourashed, Chicago State University. **Objectives:** It is often a challenge for the pharmacist to recommend a specific product within a certain herbal dietary supplement category due to the involvement of many variables. Budget is also a significant factor that may influence consumer choice of a product. Thus, the objective of this study is to use green tea supplements as a representative example to investigate the relationship between product cost and its quality markers, such as total phenolic content, catechin levels and antioxidant activity. **Method:** A total of 26 green tea supplements were randomly selected from various local stores and online vendors to reflect a wide range of variables that exist in market products. Quality was assessed in terms of (i) catechin levels (validated HPLC method); (ii) total phenolic content (Folin-Ciocalteau method); and (iii) antioxidant activity (Total Antioxidant Capacity and DPPH free-radical scavenging). **Results:** Catechin levels correlated well with the total phenolic content in each product while antioxidant activities were not as consistent when correlated with catechin/polyphenol levels. Each of the selected quality parameter was correlated with the daily cost of consumption of each product according to the serving size as stated in the label. Our results show that there is a low correlation between product cost and quality. **Implications:** Our results indicate that product cost does not always reflect quality, at least within the selected range of products. Thus, for a pharmacist to be able to recommend quality green tea dietary supplements, factors other than cost should be considered.

**Changing Answers on Multiple Choice Assessments: Does It Affect Students’ Test Scores?** James G. Henkel, University of Saint Joseph, Mark Haney, ExamSoft Worldwide, Inc., Miguel Pereira, ExamSoft Worldwide, Inc.. **Objectives:** Using the ExamSoft Snapshot function we investigated student answer choice-switching behaviors on 26 multiple-choice assessments to determine if this practice correlates with academic outcomes. **Method:** The ExamSoft Snapshot feature is highly useful to study aspects of student test-taking behavior. An analysis of SofTest answer choices was performed on assessments for 160 P1 and P2 Pharmacy students from Fall 2013, with a total of 1323 multiple choice items. The dataset was extracted from the Snapshot files, then transformed using SAS 9.3 to the answer choice selections dataset. We explored the impact of answer-switching behavior on assessment scores using one-way between-groups ANOVA with IBM SPSS Version 21. De-identified student assessment scores were divided into four quartiles for each assessment and the extent of answer choice-switching was determined for each quartile. **Results:** Across all assessments 155 students gained between 1 and 82 correct answers (mean 12.67) while only three students showed a net loss of points (maximum -5) and two showed no change. The extent of choice-switching ranged from 0.33% to 32.1%. Despite this wide variation, there was no correlation between test score quartiles and answer-switching activity in 24 of the assessments. The differences in the two remaining assessments were limited to first and fourth quartiles, as shown by post-hoc analysis using Tukey’s HSD test. **Implications:** Based on these results, the advice of not to change answers appears to be unfounded in most cases, except under special circumstances. This application is one of many potentially useful data-mining and student help operations for Snapshot analysis.

**Design, Synthesis and Kinetic Study on a Novel Amoxicillin-Erdosteine Codrug.** Michael L. Smith, Sullivan University, Sarah Baltzley, Sullivan University, Christine E. Hoffman, Sullivan University, Abeer M. Al-Ghananeem, Sullivan University. **Objectives:** The aim of this study was to design and synthesis a chemical drug carrier in the form of Amoxicillin-Erdosteine (A-E) codrug. Furthermore, to investigate the hydrolytic kinetics of the codrug and establish the drug PH-rate profile. **Method:** A three step synthetic procedure was designed starting with selective benzylation, followed by steglich esterification, and a final deprotection. The hydrolytic kinetics of A-E codrug was investigated by using reversed-phase high-performance liquid chromatography (HPLC) with UV detection. The influence of pH on the hydrolysis behavior of A-E codrug was studied in aqueous solutions. **Results:** The A-E codrug structure elucidation was confirmed by HPLC, NMR, and mass spectrophotometry. HPLC analysis revealed reasonable ester linkage stability in aqueous solutions with a pseudo-first-order kinetics at room 25°C. The log kobs-pH profile indicated that the optimal stability range was at pH 3.0-4.0. Rate constants have been determined for reactions run over a pH range of 2-10. The rate constant of overall hydrolysis as a function of temperature under the given conditions obeyed the Arrhenius equation. Analysis of the alkaline-induced degraded solution of A-E codrug by HPLC revealed two major degradation products. The limits of quantitation of the HPLC method were 0.1mg/mL for A-E codrug. The linearity of analysis showed a correlation coefficient of 0.997 over the 0.1 mg/mL - 10 mg/mL concentration range. **Implications:** The Amoxicillin-Erdosteine codrug was successfully synthesized. The codrug kinetic behavior in solution illustrated a pseudo-first-order process with optimal stability at pH range of 3.0-4.0.

**Drugs of Abuse and Addiction: an Integrated Approach to Teaching.** Susan L. Mercer, Lipscomb University, Lindsey Miller, Lipscomb University. **Objectives:** An elective class on drugs of abuse and addiction was developed by Pharmaceutical Sciences and Pharmacy Practice faculty members to evaluate the benefit of integrated teaching. Course objectives included concepts of neurotransmission, ADME and its relation to abuse potential, chronic drug administration and correlation to the development of tolerance and dependence, theories of addiction, patterns of abuse and treatment of addiction. **Method:** Five
third-year pharmacy students enrolled in the 2 credit hour elective. Teaching methodology included didactic lecture, journal club, debates, a research paper with formal presentation, an addiction exercise with reflection, external speakers from the Tennessee Department of Mental Health and Substance Abuse Services on Medication Assisted Treatment, the Drug Enforcement Agency (Nashville Field Office), and a visit to Davidson County Drug Court Residential Program (Nashville). A survey was administered upon course completion; IRB approval was obtained. Results: The Pharmaceutical Sciences faculty member taught 26.7% of the lecture hours, whereas the Pharmacy Practice faculty member taught 20%. Both faculty members were present for 53.3% of the lecture hours. All students strongly agreed that having science- and clinical-based faculty members develop and deliver course content was beneficial. Additionally, 100% of students agree to strongly agree that their research project helped them integrate and comprehend the science and practice surrounding drugs of abuse and addiction. Implications: Students enjoyed an integrated teaching approach and multiple teaching methodologies leading to increased engagement and enhancement of student learning. Low course enrollment was beneficial for personalized learning, but limited student perspective.

Faculty and Students’ Opinions on Team Assessments in a Three Year Accelerated Pharmacy Curriculum. Frederick R. Tejada, University of Maryland Eastern Shore, Dana R. Fasanella, University of Maryland Eastern Shore. Objectives: To investigate the opinions of faculty and students toward team assessment (TA) in the didactic curriculum of a three-year pharmacy program. Method: Data were collected using a self-administered questionnaire. Faculty and students rated their opinions on a Likert scale. Team assessment data were also collected and analyzed. Results: One hundred thirty four UMES-SOP students (80%) and 16 faculty (89%) completed the survey. Students’ opinions on TA were favorable on: members contribute in a significant manner (mean = 4.16 ± 0.05), helped clarify misconceptions (4.22 ± 0.94), good process for demonstrating knowledge (4.13 ± 0.98) and academic performance depends on group composition (4.33 ± 0.81). However, faculty’s opinion was less favorable on: members contribute in a significant manner (3.13 ± 0.81) and a good process for demonstrating knowledge of material (3.06 ± 0.93). Faculty thought that in TAs, members who exert less effort unfairly get a good grade (4.06 ± 0.85). Overall, students find TAs to be beneficial (4.5 ± 0.94) compared to faculty (3.44 ± 1.03). Students ranked the benefits of TA as: improves individual score > promotes collaboration > enhances understanding of material. A significant number of students (15-43%) improved their individual assessment grade level as a result of extra points from TA, strategies in assigning teams were investigated and will be discussed. Implications: The overall TA quality can be improved to further enhance student learning outcomes, both the knowledge and behavioral component. This is in keeping with the ACPE 2016 Standards which stresses the “team-ready” philosophy.

Positive Impact of Elective Courses in Native American Cultures and Health on Career-Related Choices. Victoria F. Roche, Creighton University. Objectives: To encourage pharmacy students to elect education and practice opportunities in Native American communities, including careers with the Indian Health Service (IHS). Method: Students enrolled in two elective courses on Native American cultures and health were educated on aspects of contemporary life in urban and reservation environments, cultural traditions, social and health challenges/disparities, and cultural approaches to health and wellness. Native leaders and healers, along with non-Native health care practitioners, serve as teachers. Students keep reflective journals and a subset spends 5 days immersed in a rural Navajo community where they live and work alongside IHS practitioners and Community Health Representatives. Results: Student engagement with IHS opportunities (APPes, COSTEP placements, residencies, careers) has been tracked for all 11 years the courses have been offered. Of the 69 students who have completed the experience, 11 have applied for a Junior Commissioned Officer Student Training and Externship Program (Jr. COSTEP) (8 accepted, 6 completed, 1 pending), 43 have requested one or more IHS APPes (43 accepted, 32 completed, 8 pending), 16 have applied for an IHS residency (8 accepted, 5 completed or in progress), and 4 are currently IHS Commissioned Corps officers. Four additional students are on track or actively investigating a career as an IHS officer or civil servant. Implications: The elective course experience continues to meet its primary objective of promoting practice experiences and careers in underserved Native communities. In addition to student IHS experience/career choice outcomes data, student and faculty reflections on the learning journey will be shared.

The Characterization of Analogs of ML359 to Improve the Pharmacological Inhibition of Protein Disulfide Isomerase. Alissa A. Scalise, Western New England University, Christine N. Galinski, Western New England University, Parthia P. Nag, The Broad Institute of MIT and Harvard, Sheryl Bowley, Beth Israel Deaconess Medical Center and Harvard Medical School, James Dilks, Beth Israel Deaconess Medical Center and Harvard Medical School, Sivaraman Dandapani, The Broad Institute of MIT and Harvard, Robert Flammennhaft, Beth Israel Deaconess Medical Center and Harvard Medical School, Daniel R. Kennedy, Western New England University. Objectives: ML359 is a potent and specific inhibitor of protein disulfide isomerase (PDI), a widely expressed oxidoreductase that plays a vital role in the initiation of a thrombus as well as fibrin formation. In preparation for pre-clinical studies, further evaluation of the physicochemical properties of ML359 was performed. ML359 demonstrated acceptable solubility in PBS, human plasma and GSH. Method: Over 60 analogs of ML359 were synthesized. Activity was determined by determining their inhibition of PDI activity in the insulin turbidometric assay, in which the reductase activity of PDI catalyzes insulin aggregation. Specificity for PDI over the related thiol isomerase ERp5, ERp57 and thioredoxin was determined by modifying the turbidometric assay to be catalyzed by the enzyme in question. Results: Three major substituents of ML359’s piperidine core were focused on in the SAR study. Modulation of the ethyl substituent of the ester group with bulky isopropyl or t-butyl substituents increased the mouse plasma stability from ~5% in ML359 to ~75% and ~95% in the analogs, respectively. These substitutions only minimally altered the potency of the compound (0.6-0.9 microM). These analogs also demonstrated increased inhibitory activity in platelet aggregation assays, as the inhibition demonstrated at 30 microM increased from 25% with ML359 to 97% (isopropyl) and 100% (t-butyl). Implications: The second generation analogs of ML359 display enhanced stability in mouse plasma and activity in platelet aggregation. They are also advantageous over currently available antithrombotics in that they are active against both arterial and venous clots. Thus ML359 analogs hold significant promise as potential antithrombotic agents.

Theoretical Models:

Use of Radar Plots for Curriculum Mapping. Matthew R. Dintzner, Western New England University, Eric C. Nemec, Western New England University. Objectives: The objectives of this study were to initiate the process of mapping the curriculum to the core competencies (Core Comps) of our new program and to develop a novel and
visual accessibly method for communicating the data to all stakeholders. **Method:** An online survey tool was developed to gauge the extent to which instructors and learners perceive the curriculum facilitates the learners’ ability to meet each of the ten Core Comps. Response data were collected and processed as radar plots in Microsoft Excel, with each of the ten Core Comps serving as a spoke on the plots. **Results:** Response rates for the cross section of faculty and learners surveyed was 82% and 86%, respectively. Presentation of results in the form of radar plots provided visually accessible images of the extent to which each course surveyed was perceived to contribute to the Core Comps. While each course cut its own unique shape on the radar plot, some interesting trends were readily apparent: the pharmaceutical science courses cut similar shapes on the radar plot, as did the social sciences courses; additionally progression was observed from PY1 to PY2 with regard to perceived contributions to the Core Comps. Furthermore, the radar plots identified significant spatial correlation between faculty and learner perceptions. **Implications:** This study serves to initiate the process of mapping the curriculum to the Core Comps of our new program. The use of radar plots to present perception data is visually descriptive, makes patterns/trends readily apparent, and may facilitate the development of an ongoing culture of assessment.

CONTINUING PROFESSIONAL EDUCATION

Completed Research:

Implementation of an Interprofessional Faculty Development Seminar Series Pilot Program Focused on Teaching and Learning. Evan Williams, Husson University, Jane Jarvis, Husson University. **Objectives:** To develop a structured, interprofessional, faculty development seminar series focused on teaching and learning at a new, private school of pharmacy. **Method:** A structured faculty development seminar program to improve teaching and learning methods used by faculty was identified as a need by pharmacy faculty members. An ad-hoc committee met to identify topics relevant to faculty members new to academia. A survey was sent to faculty members to determine prioritization. University experts were identified for each topic utilizing cross-departmental institutional and administrative personnel to promote interprofessionalism. To further promote interprofessionalism, faculty from the College of Health Professions and Education were invited to participate. A calendar was created and the seminars were presented. Evaluations were completed and analyzed for the majority of the seminars. **Results:** Six seminars covering eight topics were presented by nine facilitators. Pharmacy faculty attendance averaged 68% with a range of 42% - 96%. Health professions faculty attended four of the seminars. Analysis of the program evaluations indicates value both quantitatively and qualitatively. Evaluations were completed and analyzed for the major topics. **Implications:** This study serves to initiate the process of mapping the curriculum to the Core Comps of our new program. The use of radar plots to present perception data is visually descriptive, makes patterns/trends readily apparent, and may facilitate the development of an ongoing culture of assessment.

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Incorporation of Active-learning in a Continuing Professional Education Program Focused on OTC Product Recommendations. Erika L. Kleppinger, Auburn University, Amber M. Hutchison, Auburn University, Cherry W. Jackson, Auburn University, Lea S. Eiland, Auburn University, Lydia Throndill, Auburn University, Lori B. Hornsby, Auburn University. **Objectives:** To evaluate the effect of a continuing professional education (CPE) program utilizing active-learning activities. **Method:** A CPE program was developed to improve participant knowledge and confidence in OTC product recommendations through participation in active-learning activities. The program focused on five common conditions encountered in community pharmacy: constipation, diarrhea, headache, insomnia, and pediatric cough/cold. Participants voluntarily completed pre- and post-program surveys. The pre-program survey included questions to assess participants’ frequency of and potential barriers to making recommendations and 11 knowledge-based questions. The post-program survey included the same knowledge-based questions and questions to assess the participant’s likelihood to change their current practice based on the program. **Results:** A total of 55 (75.3%) and 56 (76.7%) participants completed the pre-program and post-program surveys, respectively. Participants primarily worked in community pharmacies (55%) with a majority (76%) in practice over 15 years. About half of the participants (49%) made OTC product recommendations at least once per day and identified inadequate time as the most common barrier. Before the program, 73% of participants denied using a standardized method for choosing OTC products but 80% reported being comfortable in making recommendations for adults and 53% for pediatrics. At the conclusion of the program 92.6% of participants responded they were likely to use the QuEST model. All participants reported being comfortable making recommendations for adults and 91% for pediatrics. The average score for knowledge-based questions increased from 46.7% (5.6/12) to 67.5% (8.1/12). **Implications:** Incorporating active-learning activities into a CPE program improves knowledge and
confidence in recommending products for commonly encountered conditions.

Interprofessional Education – Designing and Implementing a Successful Faculty Development Program. Claire Saadeh, Ferris State University, Deborah L. Young, Michigan State University, Curtis L. Smith, Ferris State University. Objectives: In order for interprofessional education (IPE) to gain momentum, faculty must be fully engaged in the concepts surrounding interprofessional collaboration and education. The creation and development of a faculty development program for multiple healthcare professionals will be described. Method: A three-part faculty development program was established with the goal of bringing healthcare professionals together from across the state of Michigan. Dieticians, nurses, pharmacists, physicians, social workers, and speech-language pathologists involved in educating students and residents were recruited to participate. Strategies to promote active learning were designed to encourage participants to learn with, about, and from each other. Pre-seminar surveys were designed to gather demographic information, collect pre-participation perceptions, and gather expectations. The same survey was administered after session three to determine if expectations were met and to assess if perceptions had changed. Participants who attended all three sessions and completed a pre and post survey received a certificate as an IPE provider. Results: A total of 107 individuals attended session one and 72 received a certificate. Several of the survey statements showed statistically significant changes from baseline, indicating perceptions had changed favorably. Seventy-nine percent of post-survey respondents indicated interest in further development of IPE experiences and collaboration. Implications: Educators already immersed within collaborative practices are in a prime position to lead and implement the future of IPE. This series introduced faculty and preceptors to IPE concepts, also allowing many networking opportunities. Lessons learned will be applied to future programs as they are developed.

Pharmacy Student’s Attitude Towards a Residency and the Impact Debt has on the Decision. William E. Ballough, Keysha L. Bryant, Palm Beach Atlantic University, Jamie L. Fairclough, Palm Beach Atlantic University. Objectives: To examine the motivating factors that drive students to pursue a residency and the effect of debt load on the motivating factors. Method: A 36 item cross-sectional survey was sent to 300 pharmacy students enrolled in a private institution. The survey was available for one month. All preliminary and primary analyses (i.e., Chi-Square tests and Spearman correlations) were conducted with SPSS v.22. Results: 105 respondents participated in the study. Forty-four of the respondents plan on pursuing a residency. The number one motivating factor for pursuing a residency is the perception that a residency will provide better career opportunities. The least motivating factor was whether the residency would provide a better environment. Of interest is that the 73% respondent group educational debt ($150,000 to $200,000) exceeds the national average. There was no statistical difference between the amount of debt a student has and their decision to pursue a residency. Implications: These findings are unique and provide insight on the relationship of debt and entrance into pharmacy practice. Though students have a high debt load they plan on pursuing a residency.

Preceptor Continuing Professional Development: A Grassroots Effort. Susan S. Vos, The University of Iowa, Jenna Lensmeyer, The University of Iowa, Jay D. Currie, The University of Iowa, Laura Umlah, The University of Iowa, Jennifer L. Seyfer, The University of Iowa, Sandra J. Johnson, The University of Iowa. Objectives: Continuing Professional Development (CPD) of preceptors requires a comprehensive approach (e.g. live and recorded programs, online tools, and personalized consultations). Additionally challenging, preceptors may be located across large geographic regions. A local, face-to-face encounter is one way to connect with preceptors and offer CPD. The objective of this paper is to describe preceptor development programs held across the state over three years and assess whether it met the CPD needs of preceptors. A secondary objective is to analyze the cost effectiveness of these events. Method: From 2011-2013, preceptor development programs were held across the state during the summer which included continuing education (CE) program, networking, and dinner. Locations were selected based on the number of preceptors in the area. Following the program, preceptors were surveyed to determine if the event met their continuing professional development (CPD) needs (yes, no, n/a response). Results: Fourteen events were held in seven cities across the state. Attendance at each event averaged 17 preceptors (range 3 to 70 per event). Overall, 91% of preceptors in attendance agreed the program met their CPD needs. The cost of each event included CE processing, food, facility, printing, and a small gift for each attendee. Cost per preceptor averaged $39 (increased from $29 to $45, 2011 to 2013 respectively). Implications: Face-to-face preceptor development events met the CPD needs of preceptors. Considering the preceptor’s contribution in educating future pharmacists, the cost remains low.

Short Video Lectures to Supplement the Class Lecture Time and Implement Active Learning. Shankar Lanke, The University of Findlay, Vogel Jacob, Holly Vietzke, M. Chandra Sekar. Objectives: The objective of this study is to investigate whether short video lectures (SVL) can effectively supplement classroom presentations as well as to understand how the students view such offerings. Method: SVL that lasted from 5-15 minutes were made available to students in three different courses by two different professors. Camtasia Studio7® (TechSmith) recorder software is used to record the power point presentation that plays on the computer. One month before the class commencement, the lectures are posted. At the end of the semester, students completed the anonymous ordinal survey. Results: Only 6% of the students did not watch any of the videos, while 45% watched all the posted videos. Interestingly, 29% watched the videos before coming to the class and 26% watched the videos both before and after the class. 89% of the students indicated that it improved their learning, while 90% stated that they would be interested in future postings. Implications: The doctor of pharmacy program requires extensive course work and involves in-depth content coverage with every consecutive semester. Many students find it difficult to absorb this large body of information and concepts in a very short period. It is challenging to ensure coverage of all topics in the classroom and make room for active learning activities. Henceforth, we demonstrated concepts via SVL. This study clearly suggests that SVL are a useful tool that supplements classroom presentations and that the format is acceptable by the current student population.

The Use of Educational Technologies as Teaching and a Student Learning Tool. Vivek S. Dave, St. John Fisher College, Jane M. Souza, St. John Fisher College. Objectives: Given that innovation in the use of technology is a goal present in both the College and the School strategic plans, the purpose of the study was to evaluate faculty use of and attitude toward educational technologies as teaching and student learning tools. Method: A sixteen-question Qualtrics-based survey was implemented. The survey questions explored the perceived usefulness of technology, the additional technologies desired, and barriers to adopting new technology. A majority (86%) of the faculty completed the survey. Results: The preponderance of respondents
Using Item Analysis and Faculty Review to Increase Reliability of an End-of-Year Exam. Alejandra Zettuche, University of the Incarnate Word, David F. Maize, University of the Incarnate Word. Objectives: In 2007, the Feik School of Pharmacy began administering end-of-year examinations to P1, P2, and P3 students. The goal of the Annual Student Assessment and Progression (ASAP) exam is to measure student attainment of the program’s learning outcomes at the end of each year. In 2011, the school combined analytical item analysis with individual faculty review to increase reliability of the ASAP. The objective of the current study was to demonstrate that the reliability of the ASAP exams increased following implementation of this analytical process. Method: The quality of the ASAP questions was plotted based on difficulty and biserial point. The resulting scatterplot allowed identification of questions requiring faculty review. The quality of each question improved, and subsequently, significantly increased the reliability of the ASAP exams. The coefficient alpha of internal reliability (alpha) was estimated to evaluate the exam-score reliability. The Spearman’s correlation was calculated to determine whether the alpha had statistically increased throughout the years of administration. Results: The P1 alpha of 0.61 in 2007 statistically increased to 0.78 in 2013 (r = 0.786, p < 0.042). The P2 alpha of 0.73 statistically increased to 0.84 in 2013 (r = 0.829, p < 0.042). The P3 ASAP alpha showed an upward trend to 0.882 in 2013, but the increase was not statistically significant. Implications: As pharmacy schools implement end-of-year examinations to assess student performance in their curricula, it is important to improve reliability of the assessments. This study provides an analytical technique to guide faculty in reviewing questions to ensure the highest reliability for measuring student achievement of learning outcomes.

EXPERIENTIAL EDUCATION

Completed Research:

4-week versus 5-week Advanced Pharmacy Practice Experiences. Paul C. Walker, University of Michigan, Katherine Sarah Parker, University of Michigan, Lynette Thames Davis, University of Michigan, Burgunda V. Sweet, University of Michigan, Vidya Ramaswamy, University of Michigan. Objectives: Advanced Pharmacy Practice Experience (APPE) length varies across colleges of pharmacy with information regarding optimal rotation length lacking. This study compared outcomes of 4- and 5-week APPEs. Method: Student performance on APPEs was compared between those completing a 4- vs 5-week APPE. A standard Ability-Based-Outcome Survey administered at the end of P4 year identified students’ perceptions of their abilities. Preceptor evaluations of student performance after 4- and 5-week APPEs were extracted from the College of Pharmacy experiential education database, providing overall performance and scores in specific skill areas. In addition, questionnaires were administered at the end of the P4 year to preceptors and students to assess perceptions regarding advantages and disadvantages of 4- vs 5-week APPE. Descriptive statistics, Fisher’s exact test, t-test for unequally sampled, and one-way analysis of variance with Tukey’s post hoc analysis were used for analysis. Results: Student performance, as measured by preceptor evaluations, was higher at end of 5- vs 4-week APPEs. Grades for rotations 1 and 2 were significantly higher for 5-week APPEs. APPE preceptors noted superior student performance and significant improvement with the 5-week APPE in 7 of 10 skills assessed. Students also reported an increase in their abilities at the end of week 5 compared to week 4, although no clear preference for 4- vs 5-week rotations was noted. No difference in ABO ratings between 4- vs 5-week APPEs was seen. Implications: The 5-week APPE rotations resulted in an overall improvement in student performance in specific skills when compared to the 4-week APPE rotation.

A Comparison of the Validity of Two Instruments Assessing Health Professional Student Perceptions of Interprofessional Education. Joseph A. Zorek, University of Wisconsin-Madison, David S. Fike, Eric J. MacLaughlin, Texas Tech University Health Sciences Center, Daniel G. Dominguez, University of the Incarnate Word. Objectives: Compare the validity and reliability of two instruments used to assess health professional students’ perceptions of interprofessional education (IPE). Method: Published studies document the validity and reliability of the Student Perceptions of Physician-Pharmacist
Interprofessional Clinical Education (SPICE) and Attitudes Toward Health Care Teams (ATHCT) instruments. The 10-item SPICE and 21-item ATHCT instruments were revised (named SPICE-R, ATHCT-R, respectively) so that the instruments could be used to assess student perceptions of IPPE within a broad range of health professional education programs. SPICE-R and ATHCT-R were administered concurrently to first-year students (N = 221) in pharmacy, nursing, optometry, physical therapy, and health administration programs. Confirmatory factor analysis (CFA) was conducted to compare the psychometric properties of SPICE-R and ATHCT-R. Results: Based upon CFA models, SPICE-R demonstrated acceptable goodness-of-fit on several indices while ATHCT-R lacked goodness-of-fit. SPICE-R generally demonstrated higher item and factor reliabilities than ATHCT-R. SPICE-R outperformed ATHCT-R with respect to average variance extracted. Construct validity (including convergent and discriminant validity) were established for SPICE-R. Implications: Health professional education programs incorporate IPE activities into curricula in response to evolving health policy and accreditation requirements, thereby creating a compelling need for valid and reliable instruments to assess student perceptions regarding IPPE experiences. This comparison of two instruments administered to the same student populations at the same time revealed that the parsimonious SPICE-R instrument displayed stronger psychometric properties than ATHCT-R. SPICE-R demonstrates promise as a valid and reliable tool for measuring health professional students’ perceptions regarding the impact of IPPE experiences.

A P3 IPPE Experience That Brings Value to the Institutional Setting: IV Pump Rounds. Rupal K. Parbhoo, The Ohio State University Wexner Medical Center, Christina M. Detwiler, The Ohio State University. Objectives: To create an Introductory Pharmacy Practice Experience (IPPE) that would be beneficial to both the institution and student education that could be easily replicated in subsequent years. Student activities included: navigate an electronic medical record (EMR), recognize isolation precautions, become familiar with reading an infusion pump, interact with a patient, and gain inter-professional interactions. The institution gained valuable data collection needed to answer a quality assurance question. The experience entailed development of a webinar to educate and instruct the students prior to onsite arrival as well as identification of lead pharmacists to facilitate the onsite experience. Method: A webinar was developed instructing students how to navigate the EMR, recognize isolation precautions, read the infusion pumps, and collect data for the institution’s audit. Lead pharmacists were identified and oriented to the student experience and audit process. In order to assess the quality of the activity and achievement of the outlined goals, we developed a survey that students completed after the experience. Results: 48 students completed the experience and survey. The webinar was considered helpful by 98% (47/48) of the students. Ninety percent (43/48) agreed that the experience helped them navigate the EMR, recognize isolation precautions, increased their knowledge of the infusion pumps, and be more confident approaching a hospitalized patient and interacting with other healthcare professionals. Additionally, the institution was able to gain data on 376 patients for inclusion in the quality assurance audit. Implications: Creation of a sustainable IPPE that is beneficial to both the institution and student education.

A Three-year Assessment of Students’ Perceptions of a Two-week Block Institutional Introductory Pharmacy Practice Experience. Amy C. Grimsley, Mercer University. Objectives: To develop and implement a two-week, 80 hour institutional Introductory Pharmacy Practice Experience (IPPE) for third year pharmacy students and to assess their perceptions of the experience over a three-year period. Method: An institutional IPPE program was developed and conducted over a two week block. Each year, students completed dispensing and clinical pharmacy activities at an academic medical center as facilitated by faculty, pharmacists, and residents. A 23-item survey using a 5-point Likert scale and three open-ended questions was administered to assess students’ perceptions of IPPE. Descriptive statistics were used to evaluate survey results and Kruskal Wallis was used to compare data from each year. Results: In the three-year period, eighty students completed the survey (95%). Overall, students agreed that participation in IPPE was worthwhile and would aid in preparation for Advanced Pharmacy Practice Experiences (APPE) (mean scores 4.7, 4.7, respectively). The majority of students agreed that IPPE increased their knowledge and understanding of institutional pharmacy practice and the role of clinical pharmacy specialists (mean scores 4.6 and 4.7, respectively). Students reported that rounding with clinical pharmacy specialists, time in the inpatient pharmacy, and participation in a code response simulation were the most enjoyable each year (mean scores 4.7, 4.2, 4.4, respectively). There were no significant differences between survey responses for any year. Implications: The majority of students reported positive perceptions of the IPPE program. A two-week, 80 hour IPPE program can improve students’ understanding of institutional pharmacy practice and aid in preparation for APPE.

An Evaluation of a Student-Led Orientation Series for Introductory Pharmacy Practice Experiences. Suzanne Larson, Midwestern University/Glendale, Mary K. Gurney, Midwestern University/Glendale, Hillary Aphaisuwan. Objectives: To evaluate student perceptions of their confidence and preparedness prior to beginning introductory pharmacy practice experience (IPPE) rotations and evaluate the impact of an orientation series prepared and presented by upperclassmen. Method: A small group of second-year pharmacy students developed an orientation series to help prepare first-year pharmacy students for IPPE rotations. An evaluation instrument was created and distributed to first-year pharmacy students prior to the orientation series, at the conclusion of the orientation series and at the conclusion of their IPPE rotations. Students rated their confidence and preparedness with a series of 12 statements with the following scale: Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree. Numerical values (5-1, respectively) were assigned to each scale option in order to calculate a mean level of agreement for each statement. Data analysis was completed using IBM SPSS version 19. Results: Survey response number varied for each session (pre-orientation: n = 101, post-orientation: n = 46, post-IPPE: n = 103). Student confidence and preparedness trended positively and were statistically significant for 11 statements. Results for student anxiety regarding IPPE rotations prior to and after the orientation series and after the rotation did not significantly change (p=0.56, 95% CI -0.10 – 0.35). Implications: Student confidence and preparedness increased positively with the implementation of a student-led orientation series. The findings of this study will help enhance student readiness for their experiential education within a pharmacy school curriculum. This information can also be used in the development or improvement of existing orientations for students prior to beginning IPPE rotations.

An Innovative Approach to Preceptor Development: A Preceptor Mini-Series. Craig D. Cox, Texas Tech University Health Sciences Center, Brittany Patterson, Texas Tech University Health Sciences Center School of Pharmacy. Objectives: To develop an innovative, interactive, and entertaining continuing education (CE) program designed as a mini-series. Program will provide training for both new and experienced pharmacy preceptors. Method: The mini-series
An Interprofessional Education (IPE) Fingerprint for APPEs: Developing Metrics for Collaborative Interactions. Jennifer Danielson, University of Washington, Anne Kim, University of Washington, Stanley S. Weber, University of Washington. Objectives: To characterize interprofessional interactions and collaboration among advanced pharmacy practice experiences (APPE) from students’ perspectives. Method: As part of the web-based, end-of-APPE evaluation, 82 students completed questions regarding the scope of interprofessional interactions experienced at APPE sites (Clinic, Community, General Medicine (GenMed), Inpatient, or Other). Questions targeted level of integration with team (observation through direct participation in decision making) and frequency/method of interactions. Perceptions of their roles on interprofessional healthcare teams and shared levels of accountability for patient outcomes were assessed. Data was continuously collected over a 6-month period. Analysis was completed using Excel which revealed expected and unexpected trends of interprofessional interactions across APPE sites. Results: More students in GenMed (48%) and Other (42%) APPEs reported full integration into the team compared to Clinic (40%), Community (39%), and Inpatient (38%) APPEs. Fifty-two percent of GenMed sites reported full accountability for patient outcomes. Next to physicians (67%), the second highest professional with whom students participated in decision-making were dieticians (53%) at GenMed APPEs. Social workers were ranked highest as professionals with whom students observed patient-care at Clinic (63%) and Community (56%) APPEs. One student, at a GenMed APPE, reported having insufficient learning scenarios portrayed by actors and a reflective dialogue by two faculty members serving as preceptor experts. Each episode ends with a minimum of two clinical pearls related to precepting. Twelve individual episodes are available for CE credit in 15-minute increments as a combination of mini-series scenario followed by participant reflection. Participants completing all twelve episodes will obtain three hours of preceptor CE. Implications: New and innovative methods for preceptor training are needed to reach preceptors who possess a diversity of learning styles and this preceptor mini-series offers a strategy to help accomplish this.

Application and Interpretation of Background Check Information during the Admission Process for PharmD Applicants. Lori J. Duke, The University of Georgia, Deanna W. McEwen, The University of Georgia, Regina L. Parham, Lindsey H. Welch, The University of Georgia, Linda D. Hughes, The University of Georgia. Objectives: To evaluate the prevalence of school policies requiring background checks for use in the PharmD admissions process; identify the use of additional information in deciding acceptability of applicants with positive background checks; and identify convictions resulting in automatic refusal. Method: An online survey (Qualtrics®) was emailed to faculty responsible for PharmD admissions at all accredited US institutions admitting students in Spring 2013. Email reminders were sent at 2 and 4 weeks. Information was gathered on 41 conviction types (repeat convictions included) over a variety of post-conviction timeframes. Results: 61 of 127 (48%) institutions participated in the survey, while 50 (39%) completed the survey. 44 of 61 (72.1%) had a policy on using background checks during admissions. Of these, 55% combined the use of background check information, supporting documentation, and a personal interview regarding the event in the admission decision. 30.3% of institutions had policies for automatic refusal of applicants with felony convictions; however, 93.9% had no policy related to misdemeanor convictions. The most common non-felony convictions resulting in applicant refusal were multiple DUI (30.3%), multiple marijuana (33.3-42.4%), and terrorist threat (24.2%) convictions. Implications: Although most pharmacy schools have policies on using background check information during the admissions process, the majority of decisions are made on a case by case basis, even in felony convictions. Schools must balance providing educational opportunities to students with potentially admitting individuals unable to matriculate due to clinical placement rejections. Future research should target experiential sites to assess their policies on trainee background check information.

Are Ambulatory Care IPPEs Effective? Amber Warren, The University of Oklahoma, Teresa H. Truong, The University of Oklahoma. Objectives: To gather insight from P1 and P2 students about the quality and usefulness of the time spent in a single clinical-based ambulatory care site. Method: P1 and P2 students visiting a pharmacotherapy clinic for the first time between Fall 2010 and Spring 2012 were required to write reflective essays before and after their one day site visit. They were asked to reflect upon their assumptions of ambulatory care and the skills required of pharmacists in this setting. In addition, students ranked their interest in ambulatory care pharmacy using a Likert scale. Post reflection essays were analyzed for recurring themes and descriptive statistics used. Results: Seventy reflection papers were analyzed. Sixty percent of students wrote that their expectations of the site were exceeded while 24% stated their expectations were met. The remaining did not address expectations. Three areas in which students commented the most was a pharmacist’s degree of independence and responsibility under collaborative practice agreements (43%), the importance of chronic disease state management (36%), and the amount of time committed to patients (22%). The top three themes regarding skills required of a pharmacist included communication skills (46%), strong knowledge base (56%), and transfer of skills to the real world setting (52%). Interest in ambulatory care also increased following their site visit (p < 0.0001). Implications: Clinically based ambulatory care IPPE site visits can serve as an outlet for students to understand and solidify concepts and skills taught in the classroom while also broadening career choices.

Assessing Implementation of Hospital/Health-System/Institutional Introductory Pharmacy Practice Experiences (H-IPPEs) across Colleges/Schools of Pharmacy in the US. Hyma P. Gogineni, Western University of Health Sciences, James D. Scott, Western University of Health Sciences, Doreen Pon, Western University of Health Sciences, Anandi V. Law, Western University of Health Sciences. Objectives: Given the limited number and diversity of institutional
experiential sites, this study was undertaken to assess implementation of hospital/health system/institutional IPPEs (H-IPPEs) across colleges/schools of pharmacy in the US. **Method:** We developed a survey to obtain information on 1) implementation of curricular aspects of H-IPPEs, 2) perceived value to experiential sites, and 3) barriers to providing H-IPPEs. An expert panel evaluated the survey for face and content validity. The survey was fielded using Qualtrics, a web-based program, to appropriate personnel at all accredited colleges/schools of pharmacy in the US, obtained via American Association of Colleges of Pharmacy and the Experiential Special Interest Group. **Results:** Of the 127 colleges/schools contacted, 80 attempted and 43 completed the survey (response rate 34%). Of these 43 colleges 48% were public and 53% private. About 80% reported student involvement in distribution (unit dose preparation, IV preparation), while 25% reported involvement in clinical activities (pharmacokinetics, monitoring) during H-IPPEs. Only 21% used simulation (average 20 hours) as part of H-IPPEs. Barriers identified included too many pharmacy schools, not enough hospitals, and finding sites closer to colleges. Despite a low prevalence of incentives for H-IPPE sites (<25% of sites), majority of colleges/schools reported positive feedback from H-IPPE sites about their students (88%) and H-IPPE program itself (79%). **Implications:** Despite competition for H-IPPE sites among colleges/schools, the majority of them did not use simulation as part of H-IPPE. Distributive activities were more commonly included as part of H-IPPE compared to clinical activities. Most colleges/schools received positive feedback from practice sites about their H-IPPE program and students.

**Assessment of Student Perceptions of the Benefits of Early Experiential Rotations on Didactic Education.** Robert B. Stanton, Marshall University, Craig A. Kimble, Marshall University, H. Glenn Anderson, JR., Marshall University, Stephanie Anderson, Texas Tech University Health Sciences Center, Kimberly A. Broedel-Zaugg, Marshall University. **Objectives:** The Marshall University School of Pharmacy (MUSOP) ascertained student perceptions of the value and benefits of early experiential rotations in the first semester of pharmacy school on didactic education. **Method:** MUSOP begins P1 experiential rotations early in the students’ professional academic career starting at week 6. P1 students are assigned to a 40 hour, 5-week block to a community or institutional experiential rotation. Preceptors as well as faculty members voiced concerns about beginning rotations so early in the curriculum; the results of the preceptors’ assessment of early experiential rotations have been reported previously. Students were anonymously surveyed during their second year regarding their opinions on their first experiential rotations in their P1 year. The survey tool Qualtrics was used to obtain opinions anonymously. The survey consisted of two major domains with five questions within each domain. The first domain ascertained opinions on the overall philosophy of the early P1 rotations and not on specific issues. The second domain focused on specific performance and the impact the rotation had on student behavior. The response choices were in the construct of a Likert scale. **Results:** Of 78 P2 students, 65 (83.3%) completed the survey. 80% responded that “Having an IPPE rotation during the first semester of professional studies is beneficial for my professional development”. 76% responded that they had improved their communication skills. 91% indicated that “their overall understanding of the practice of pharmacy improved.” **Implications:** Whether early rotations in the first year have any merit from the students’ perspective on their didactic education.

**Behavioral Changes in Pharmacy Students After Experiencing Interprofessional Education Activities.** Shane Tolleson, Catherine L. Hatfield, University of Houston. **Objectives:** To compare pharmacy students with no Interprofessional Education (IPE) to pharmacy students with IPE to determine if there were any differences in behavior toward other professions. Also, to assess the differences in attitude and behavior toward other professions in pharmacy students after completing IPE experiences **Method:** A survey of third and fourth year pharmacy students addressing attitudes and behaviors in regards to the nursing and medical professions was analyzed using descriptive statistics and bivariate analyses to address the study objectives. **Results:** There was no significant difference detected between the behaviors of students that had experienced IPE versus students that did not experience IPE. However, IPE experienced students demonstrated a significant increase in their level of comfort with questioning other professions and being questioned by other professions after IPE. Students also experienced a significant increase in the perceived reliability and accuracy of information from nurses after IPE. **Implications:** Students who have experienced IPE gain a higher level of comfort communicating concerns with other healthcare professionals. Improved communication can lead to a decrease in errors and improved patient outcomes through a higher level of collaboration.

**Cloud-Based Experiential Rotation Organization: Educational Opportunities and Possibilities.** Bryson M. Duohon, The University of Texas at Austin, Laurajo Ryan, The University of Texas at Austin. **Objectives:** With the increased emphasis on the “flipped” classroom model and its inherent reliance on technology, innovative modalities are needed to organize, educate, and engage pharmacy students. Cloud-based storage programs provide a unique opportunity to guide and track students’ progress throughout an advanced pharmacy practice experiential (APPE) rotation. **Method:** We describe the use of a novel cloud-based storage application, UTBox®. This system is capable of electronically transmitting, storing and protecting FERPA Category I data. UTBox® provides the educator with detailed feedback regarding students’ retrieval of rotation documents. In addition, it allows standardization of the rotation experience, and provides a seamless exchange of materials between the student and educator. **Results:** Six months of real world experience with UTBox® has exposed interesting strengths and weaknesses of using a cloud-based system to organize an experiential rotation. Positive aspects of cloud-based organization include the secure storage, and transmission of protected evaluations and evolving student presentations, as well as the ability to instantly disseminate medical literature. Because UTBox® provides detailed records of access to documents, it provides insight into individual student preparation. This can be particularly useful when attempting to determine causes of poor performance during topic discussions. Our struggles with using a cloud-based system primarily focus on the need to depend on software and connectivity to access documents, and the inability of less technologically savvy students to fully grasp how to use the system proficiently. **Implications:** Future study avenues include correlating document downloads with student performance, and exploring student satisfaction with UTBox®.

**Comparison of Institutional IPPE in Urban vs. Rural Hospital.** Frank McGrady, Husson University, Conrad Dhing, Husson University. **Objectives:** The purpose of this study was to compare and assess the institutional experiences of IPPE students at a rural and an urban hospital. Maine is a relatively small state with only 39 hospitals. Twenty of these hospitals are rural hospitals which needed to be utilized as experiential sites for IPPE. **Method:** A cohort of second-professional year IPPE students was placed at a large, urban 637-bed tertiary care hospital and another, at a rural 25-bed critical access hospital for a three week rotation in January 2013 and May 2014 respectively. Quantitative factors assessed were observed professional
disciplines, activities, and time spent with pharmacist. Qualitative
factors included depth of practice and pharmacist interaction with
students. Data were collected and analyzed. Results: Five students
were placed at the urban hospital and three were placed at the rural
hospital. The average scores for student satisfaction with hospital
personnel were higher in the rural hospital [3.89 vs. 3.49]. Both hospital
sites provided students with comparable experiences in terms of un-
derstanding how the pharmacy department works in a hospital. Stu-
dents at the rural hospital experienced a wider variety of hospital
personnel and disciplines, and received more customized instruction
in areas such as pharmacy, physical therapy, nutrition, occupational
therapy, surgery, nursing, and physician interaction. Implications:
Results from this study allowed the school of pharmacy to be confident
in its ability to provide each student with a comparable educational
experience regardless of location of the hospitals.

Comparison of Aseptic Compounding Technique Before and After
Modified Laboratory and Introductory Pharmacy Practice Expe-
riences. Vincent C. Dennis, The University of Oklahoma, Alice E.
Kirkpatrick, The University of Oklahoma, Sandra M. Carter, The Uni-
viersity of Oklahoma. Objectives: To determine whether addition of
lab-based aseptic compounding activities and an introductory
pharmacy practice experience (IPPE) in institutional practice de-
creases aseptic technique errors between the P2 and P3 years. Method:
Curricular changes prompted implementation of an 80 hour IPPE in
institutional practice the summer between the P2 and P3 years and a
sterile product laboratory was added to the P2 year. Students in both
P2 and P3 courses viewed aseptic compounding videos and completed
practice compounding sessions while receiving instructor feedback.
Students prepared a final simulated volume parenteral product
with a single additive while an instructor rated aseptic technique errors
via checklist. Campus location, hospital experience, and site of institu-
tional IPPE were included as co-variables. Chi-square and General-
ized Estimating Equations (GEE) analyses were used to investigate
the association of errors with individual or multiple independent variables.
Results: Minor errors occurred for 45 (39.5%) of 114 students during
the P2 assessment, significantly more than the 29 (25.4%) that oc-
curred during the P3 assessment (p = 0.02). Likewise, 37 students
(32.5%) committed major errors during the P2 assessment, compared
to 17 (14.9%) during the P3 assessment (p = 0.002). GEE results
showed students were 2.74 times more likely to commit a major error
in the P2 year than the P3 year (p = 0.0026; 95% CI = 1.42-5.28), with
no significance indicated for campus, work experience or IPPE site.
Implications: Instructor-rated aseptic technique errors by students
were significantly reduced between the P2 and P3 years. Additional
training is needed, and validation of aseptic technique through media
fill methods should be considered.

Creating Pharmacy Services at the 2013 National Boy Scout Jam-
boree. Keith DeMonte, St. John Fisher College, Margaret Helber, St.
John Fisher College. Objectives: The National Boy Scout Jamboree is
a two-week event held every three years and attracting over 40,000
Scouts and nearly 10,000 staff members. Providing high-quality med-
ical and pharmacy services to the contingent required the services of
560 medical staff members including twelve pharmacists and one
APPE rotation student. Method: The pharmacy staff developed a med-
ication acquisition and distribution process designed to address the
challenges of the new, remote event site in West Virginia. For each
of the nineteen medical facilities at base camps and activity areas, the
pharmacy staff stocked lock boxes containing emergency medications
including cardiac drugs and several controlled substances. Pharma-
cists conducted daily medication discussions with physicians and
nurses to determine demand for medications and fluids to allow for
timely reordering and supply. An after-action report based on medical
staff survey data provided details for future improvements. Results:
Based on medication orders and returned inventory, more than 10,000
interventions related to medications occurred during the event. Forty
prescriptions for items not on the formulary were acquired from out-
side pharmacies. Twelve pharmacists staggered over the two-week
event provided sufficient coverage for twelve-hour daily pharmacy
hours and base camp deliveries, and provided off-hour deliveries of
emergency medications. The after-action report survey reflected a high
level of satisfaction by the medical staff for the pharmacy services,
especially the face-to-face discussions to plan for daily needs. Implica-
tions: The pharmacy services strategy implemented at the Jamboree
successfully provided prescription medications, OTC products, emer-
gency boxes and medication counseling for the estimated fifty thou-
sand participants in attendance.

Design and Implementation of Evidence-Based Health Screening
Trainings. Jeanne Abrons, The University of Iowa, Michael W. Kelly,
The University of Iowa, Susan S. Vos, The University of Iowa. Object-
ives: Students are required to complete ten professional service hours
as part of their Introductory Pharmacy Practice Experiences). Common
areas of service include cardiovascular, osteoporosis, and diabe-
tes screenings. Previously, no formal processes or training existed for
these screenings. The objective of this paper is to describe develop-
ment and use of service event training. Method: Evidence based con-
tent was reviewed for common areas of service to identify guidelines
and target at-risk populations. Blood pressure (BP), osteoporosis,
and diabetes screenings materials were developed (e.g. protocols,
frequently-asked-question, forms, documentation, and training pre-
sentations). Training and assessment of student was required in order
to receive credit for participation. Following training, participants
were surveyed regarding reasons for and barriers to participation.
Results: Over two years, 16 diabetes and 17 bone density and BP train-
ings were offered. 415 students were trained in screening processes (BP
n = 155; diabetes n = 150; bone density n = 110). 30 responses to the
survey were obtained. Responses indicated most common factors pro-
moting participation in trainings included multiple session offerings and
credit offered. Barriers indicated included schedule conflicts and overlap
of processes. Solicited comments from preceptors indicated student im-
provement at events. Student comments indicate appreciation of consis-
tent approach and preparation of materials. Implications: Training for
service events is one way to ensure a consistent approach is taken at each
event. Future direction for the project includes streamlining processes,
development of a recertification process, and creation of additional sup-
plemental materials (e.g. quick reference cards and brochures).

Development and Implementation of a Medication Therapy Man-
agement (MTM) Community Service Event Using Outcomes
MTM. Matthew D. Kostoff, The University of Kansas, Tiffany R.
Shin, The University of Kansas, Robert L. Emerson, The University
of Kansas. Objectives: The objective of this community service event
was to improve student understanding of medication therapy manage-
ment (MTM) services with the use of OutcomesMTM to enhance their
learning experience. Method: Prior to participation, students were
required to complete an online training module for OutcomesMTM.
Students were placed into groups of three students plus a preceptor,
with each group consisting of a first year, second year, and a third or
fourth year student. The groups conducted MTM with patients at the
community service event and utilized OutcomesMTM to create a per-
sonal medication record and medication-related action plan for each
patient. No follow-up was conducted and services were not billed.
After completion, students were asked to complete a six question online survey. Survey questions related to student perceptions on understanding of MTM as well as attitudes towards the experience based on a 5-point Likert scale (1-strongly disagree; 5-strongly agree). **Results:** A total of 45 students participated in this event; 39 students (86.7%) completed the online survey. The survey found that 18/39 (46.15%) described their level of understanding of MTM prior to participation as “Not Knowledgeable”, which improved to 21/39 (53.9%) describing their understanding as “Knowledgeable” following the event. On the Likert scale, when asked if OutcomesMTM enhanced their learning of MTM, 23/39 (59.0%) agreed and 5/39 (12.8%) strongly agreed. **Implications:** A positive impact on students’ perception of understanding of MTM services was observed. Combined with student support of using OutcomesMTM to enhance learning, faculty have justification to further build upon this experience.

**Development of an Interprofessional Health Promotion Course for a Vulnerable Population.** Ann M. Ryan Haddad, Creighton University, Kimberley J. Begley, Creighton University, Kathleen A. Packard, Creighton University, Joy Doll, Occupational Therapy Program, Creighton University School of Pharmacy and Health Professions, Ann Laughlin, College of Nursing Creighton University, Martha Todd, College of Nursing Creighton University, Jennifer Yee, Exercise Science, Creighton University, Barbara Harris, Department of Social Work, Creighton University. **Objectives:** The objective was to develop and pilot an interprofessional health promotion course through the context of community engagement. This allowed students to develop health promotion competencies in an authentic environment.

**Method:** An interprofessional hybrid course, of online and face-to-face modules, was created by health science faculty. Health professions students from the disciplines of nursing (n=2), occupational therapy (n=2), pharmacy (n=2), social work (n=1) and exercise science (n=1) were recruited by faculty. The course focused on acclimating students to their discipline and others on the teams, exploring the context of vulnerability, evaluating case scenarios, and promoting interprofessional dialogue and interactions between both students and faculty. The students engaged in learning activities, discussed team skills, and developed a collaborative agreement for how the teams would interact. In partnership with the community, two community members who were currently experiencing complex health issues were invited to participate as clients for the course. At the beginning and end of the course, students completed the Team Skills Scale. **Results:**

- There was a non-significant increase in the mean Team Skills Scale score (70.0+11.1 pre versus 75.9+13.0 post, p=0.09). Students’ reflections will also be presented. **Implications:** Though the data show trends in perceived improvement of skills needed to work as part of an interprofessional team, statistical significance may not have been achieved due to small sample size (n=8). These data show that a semester long interprofessional course in caring for vulnerable populations may improve students’ perceptions of their abilities to work as part of an interprofessional team.

**Does Who You See Affect What You Know?** Craig D. Cox, Texas Tech University Health Sciences Center, Chris Tawwater, Texas Tech University Health Sciences Center, Adam Brown, Baylor St. Lukes Medical Center, Charles F. Seifert, Texas Tech University Health Sciences Center. **Objectives:** To evaluate differences in objective final exam scores based on the numbers and types of patients students care for during their Adult Medicine Advanced Pharmacy Practice Experience (APPE). **Method:** Eight disease state categories were identified including pneumonia, electrolytes, cirrhosis, soft tissue infections, acute coronary syndrome, venous thromboembolism, COPD, and acute decompensated heart failure. Using data from student monitoring forms we quantified the number of patients students care for whom are being treated for these Adult Medicine APPE disease states. We compared these results with student final exam grades to assess the effect of seeing patients on pharmacotherapy knowledge. **Results:** 110 students have participated in the project. Students reported seeing a mean of 1–2 patients per week with each respective disease state, with STEMI being least and electrolytes the most common. Mean overall final exam grade was 70%. Grades on individual disease state sections ranged from 62–93% with performance on pneumonia being worst and COPD best. There were no statistically significant correlations between the number of patient encounters and final exam scores. There were also no statistically significant differences in exam scores or number of patient encounters identified between campus or preceptor type. **Implications:** It does not appear that student performance on an objective disease state exam for the Adult Medicine APPE is influenced by the types of patients seen during a rotation. Future research might consider impact of quantity and type of disease state discussions on final exam performance.

**Does Lecture-based Pharmacotherapy Content Reinforced in a Laboratory Setting Improve Student Performance on Multiple-choice Exam Items?** Itsarawan Sakunrag, School of pharmacy, Beth A. Martin, University of Wisconsin-Madison, James Wollack, Department of Educational Psychology Director University of Wisconsin, Madison WI, Andrea L. Porter, University of Wisconsin-Madison. **Objectives:** To evaluate whether students performed significantly differently on multiple choice question (MCQ) items based on content placement and Bloom’s taxonomy level. **Method:** A retrospective cohort study was performed for 129 student pharmacists enrolled in Pharmacotherapy I and II courses for the 2012–2013 academic year. Seven MCQ exams were obtained and items coded based on whether the item content was covered in lecture only (LEC), laboratory only (LAB) or in a combination of lecture and laboratory (COMBO). MCQs were also categorized as requiring lower or higher order thinking skills based on the revised Bloom’s taxonomy. Two-sample t-tests were used to compare mean scores on content placement and taxonomy levels. **Results:** A total of 287 MCQ items were analyzed. Of those, 178 (62.02%), 101 (35.20%) and 8 (2.78%) items were identified as LEC, COMBO and LAB, respectively. Additionally, 11.79% of LEC items and 26.73% of COMBO items were identified as requiring higher order thinking skills. There was a significant difference between student performance on the LEC and COMBO group (p=0.04; 95% CI -12.25 to -0.16). In the subgroup analysis, there was no significant difference between student performance on the LEC and COMBO items requiring higher order thinking (p=0.96; 95% CI -13.09 to 13.73). **Implications:** Reinforcing lecture content in a laboratory setting appears to improve student MCQ exam performance. However, higher order examination performance was not impacted by the content placement, perhaps due to the small number of higher order exam items written. Future directions include purposeful exam blueprints to determine causation.

**Evaluation of Pharmacy Student Self-Care Activities on Community Introductory Pharmacy Practice Experiences.** Brett Feret, The University of Rhode Island, Katherine K. Orr, The University of Rhode Island, Alev Gulum, The University of Rhode Island. **Objectives:** The purpose of this study is to determine if there is a relationship between the timing of a self-care course and the nature and content of student interventions on community introductory pharmacy practice experiences (IPPE). **Method:** During a community IPPE, students are required to electronically document at least 5 self-care encounters. These
Evaluation of a Simulated Electronic Medical Record (SimEMR) into a Introductory Pharmacy Practice Experience. Maria Leibfried, St. John’s University, Michele Pisano, St. John’s University. **Objectives:** To incorporate informatics and evaluate the usefulness of a commercially available simulated electronic medical record in the institutional practice-setting component of a simulated Introductory Pharmacy Practice Experience (IPPE). **Method:** At St. John’s University, we have implemented a simulated IPPE for pharmacy students in their first professional year. We incorporated a commercially available web-based electronic medical record (SimEMR) into the institutional pharmacy practice setting modules within the simulated rotation. A survey was distributed to all 365 students enrolled to evaluate their prior experiences with EMR, understanding of the role of EMR in an institutional practice setting, and level of confidence in utilizing EMR on their upcoming hospital rotations. **Results:** 270 students completed the survey (response rate of 74%). Prior to this rotation, only 9.6% of students had experience with EMR. An overwhelming majority of students felt that SimEMR adequately demonstrated the role of informatics in managing the simulated hospital patients and enhanced their hospital learning experiences (83.7%, 78.9% respectively) in simulated IPPE. As a result of using SimEMR, 72.6% of students feel more prepared to utilize EMR in upcoming hospital IPPE rotations. **Implications:** Most hospitals and facilities are transitioning from paper charts to electronic medical records (EMR) in response to federal initiatives. The SimEMR offers realistic hospital charting and gives the pharmacy students exposure to electronic medical records, which are important components of practicing pharmacy in a facility or institution. Utilizing SimEMR allows pharmacy students to gain knowledge and apply skills in navigating medical records and extrapolating data for patient case scenarios.

Evaluation of an Advanced Clinical Track Program: Seven Years Experience. Lisa M. Lundquist, Mercer University, C. Lea Bonner, Mercer University. **Objectives:** To evaluate the Advanced Clinical Track (ACT) program created to provide clinical and research opportunities to prepare fourth professional year students who plan to pursue postgraduate residency training. **Method:** Established in 2008, the ACT Program is designed for students to complete four advanced pharmacy practice experiences at one health system (community-based or academic), conduct a year-long research project at the health system, and present the findings in a formal setting. Interested students must apply to the program, possess a minimum 3.25 GPA, and participate in face-to-face interviews with all participating health systems. Results of health system evaluations are utilized by a selection committee for student placement decisions. Commitment letters are signed by the students selected. **Results:** Over seven consecutive years, 85 students have been selected to participate in the program. Student participants have increased annually, from six (2008-2009) to eighteen (2014-2015). To date, 85% of students completing the ACT Program have completed post-graduate residency or fellowship training. 100% of ACT students have presented their clinical research project as a poster at national and/or state pharmacy meetings. Participating health systems in the ACT program have increased from five to nine throughout the state, with 56% requesting more ACT students in subsequent years. Anticipated limitations for continued growth are adequate number of health system experiences and preceptors to coincide with the increasing student interest. **Implications:** An advanced clinical track program during the fourth professional year can provide a challenging combination of research and clinical experiences to better position graduates for candidacy for residency training.

Evaluation of Deficiencies in Challenging Learners by faculty Preceptors in the Experiential Pharmacy Setting. Jessica H. Brady, The University of Louisiana at Monroe, Jennifer G. Smith, The University of Louisiana at Monroe, Jill M. Comeau, The University of Louisiana at Monroe, Tibb F. Jacobs, The University of Louisiana at Monroe. **Objectives:** The purpose of this study was to determine the quantity of challenging learners encountered by faculty preceptors, as well as specific competencies the learners lack, and problem-solving ability needed in dealing with these learners during their advanced pharmacy practice experiences. **Method:** An electronic survey was administered via e-mail invitation to faculty preceptors at a school of pharmacy. Information on demographics, quantity of challenging learners, type of competency problem identified, personal assessment of competency problem, and difficulty in dealing with competency problem was collected. Data were summarized using descriptive statistics and analyzed for identification of suggested focus areas for faculty development activities. **Results:** Eighteen of 28 faculty preceptors responded to the survey. Participants were primarily in practice settings in ambulatory care (33.3%), academia (27.8%), or acute care (22.2%) and precepted 11-15 students per year (55.6%). Most preceptors identified at least 1 challenging student in the past year. The most common primary issue noted in these challenging learners was attitude (61%); others identified skills (33%) or knowledge (11%) as the primary issue. The most common types of remediation were informal discussion (31.9%) and formal evaluation feedback (27.7%), with most respondents ranking the remediation method used as “somewhat successful”. **Implications:** This survey identified issues our pharmacy faculty preceptors face regarding challenging learners, primarily attributed to students’ attitude during rotation experiences. These results will allow us to implement faculty development activities to improve preceptors’ ability to manage attitude problems and improve the management of challenging learners in the experiential setting.

Evaluation of Multi-course Integrated Learning on Pharmacy Student Competence in Self-care Counseling. Neal S. Fox, Phillip Thornton, Cedarville University, Aleda M. Chen, Cedarville University, Thad Franz, Cedarville University, Tracy Frame, Cedarville University, Jeb Ballentine, Cedarville University. **Objectives:** To evaluate whether the integration of a self-care course, pharmacy practice lab, and experiential education has a significant impact on pharmacy student competence in self-care counseling. **Method:** Students in a first professional-year self-care course (N=47) learned self-care
topics (i.e., analgesics, heartburn) each week using a team-based learning format. The following week, students were assessed in simulated patient counseling encounters with faculty (N = 9) in a pharmacy practice lab setting, for a total of 9 different self-care topics. Students then practiced counseling on the same topics in their community pharmacy IPPE three times during the semester (Analgesics, Heartburn, and Cough/Cold). A rubric was created from a literature review and underwent expert review for content and face validity. Faculty utilized it to assess students’ interpersonal skills and self-care counseling (14 items, 4-point, Likert-type, 1 = Unsatisfactory, 4 = Commendable, Range = 14-56). Data were analyzed using descriptive statistics and Friedman’s tests. Results: Students’ median total scores significantly improved over the course of the semester from 46 to 51 (p < 0.001). Scores also significantly improved on 11 of 14 individual items (e.g., Interviewing Skill, Word Use, Giving Information, Body Language, Empathy, Current Complaint Assessment, MAC Information, Treatment Suggestions, Medication Overview, Closure/Teach-Back, and Quickness/Accuracy of Assessment: p ≤ 0.001). Three items (e.g., Attitude and Atteniveness, Professionalism, and Self-Care Candidacy) were commendable or nearly commendable initially (median = 4, 4, and 3, respectively) and did not change significantly over time.

Implications: Students significantly improved in patient counseling abilities overall and in specific items. Integration-based learning for self-care concepts is beneficial for student learning and competency acquisition.

Evaluation of Multi-course Integrated Learning on Pharmacy Student Confidence in Self-care Counseling. Phillip Thornton, Cedarville University, Aleida M. Chen, Cedarville University, Thad Franz, Cedarville University, Tracy Frame, Cedarville University, Jeb Ballentine, Cedarville University, Nea Fox, Cedarville University. Objectives: To evaluate whether the integration of a self-care course, pharmacy practice lab, and experiential education improves student pharmacist confidence regarding self-care counseling. Method: Students in a first professional-year self-care course (N = 47) learned self-care topics (i.e., analgesics, heartburn, cough and cold) during weeks 3, 9, and 13 of the semester. The following week, students practiced counseling faculty in a simulated environment and then counseled a patient in their community-based introductory pharmacy practice experience (IPPE) on Friday. A confidence survey was created from the literature to assess self-confidence in communication, appropriate self-care plan, triage, and drug knowledge (19 items, 5-point, Likert-type, 1 = Not at all confident, 5 = Extremely confident, Range = 19-95). For each topic, students completed the survey (1) prior to class, (2) immediately after class, and (3) following IPPE patient counseling. Data were analyzed using descriptive statistics and Friedman’s tests. Results: Students’ self-confidence significantly improved at every assessment (pre-class, post-class, and post-counseling; p < 0.001) for each topic. Median confidence scores increased from 58 to 71 (p < 0.001) for analgesia, 62 to 79 (p < 0.001) for heartburn, and 57.5 to 79.5 for cough/cold. Confidence was not significantly different between topics at the same point during the educational process (i.e., analgesia pre-class vs. heartburn pre-class). Implications: Student confidence improved significantly on self-care concepts and counseling following integration of class, practice lab, and experiential education. Intentional integration between courses is beneficial for learning and utilization of knowledge, as students must have confidence in their abilities.

Evaluation of Required Senior Research Projects across Different Pathways within a Doctor of Pharmacy Curriculum. Mitra Assemi, University of California, San Francisco, Robin L. Corelli, University of California, San Francisco. Objectives: This study assessed faculty perceptions and dissemination outcomes of required research projects completed by Doctor of Pharmacy students enrolled in research-intensive pathways [Health Services and Policy Research (HSPR; n = 117) and Pharmaceutical Sciences (PS; n = 74)] at the University of California, San Francisco School of Pharmacy from 2002-2011. A secondary aim compared similar outcomes between these two pathways to a less research-intensive pathway [Pharmaceutical Care (PC)]. Method: A web-based survey of preceptors for each project determined preceptors’ perceptions regarding project value and dissemination-related outcomes. Where possible, results were compared to a similar study assessing PC pathway projects conducted from 2002 to 2007. Results: Surveys were completed for 159 projects (HSPR = 102; PS = 57) for an overall response rate of 83.2%. The majority of preceptors (71.7%) agreed that students were adequately prepared and that research projects provided a valuable student learning experience (82.4%). Dissemination of study results through poster/platform presentations and/or publications was not significantly different between the two research-intensive pathways. In contrast, HSPR and PS projects were more likely than PC projects to be disseminated through poster (40.7% vs. 18.8%; p < 0.001) and platform (18.5% vs. 2.2%; p < 0.001) presentations at national/international meetings, and to be submitted (40.7% vs. 10.7%; p < 0.001) and accepted for publication (33.3% vs. 5.4%; p < 0.001). Implications: Most HSPR and PS project preceptors perceived the required pathway project to be a beneficial and valuable learning experience. Students completing a research-intensive pathway are significantly more likely to disseminate their study findings than students graduating from a less research-intensive pathway.

Evaluation of the Multiple Mini-interview across Stakeholders in a School of Pharmacy Admissions Process. Robin L. Corelli, University of California, San Francisco, Ryan J. Beechinor, University of California, San Francisco, Jennifer M. Coolhob, University of California, San Francisco, Eleanor M. Vogt, University of California, San Francisco, Candy Tzourounis, University of California, San Francisco, Karen S. Hudmon, Purdue University. Objectives: To evaluate perceptions of a newly implemented multiple mini-interview (MMI) process for pharmacy school admissions across multiple stakeholders (candidates, interviewers, admissions committee members) and estimate the comparative costs required for the MMI and standard interview formats. Method: Candidates (n = 285), interviewers (n = 53), and admissions committee members (n = 39) received an anonymous web-based survey assessing perceptions of the process. Costs were estimated using actual training and staffing schedules from the 2012 cycle (standard format) and the 2013 cycle (MMI format). Results: Response rates were: candidates (86%), interviewers (83%), and admissions committee members (87%). Among candidates, 34% agreed that the MMI is less stressful than a standard interview. Most interviewers (73%) believed that they were able to formulate an accurate assessment of the candidate’s abilities using the MMI format, and 38% of admissions committee members perceived that the information obtained via MMI was more useful than the information obtained via the standard interview process. The proportion of candidates, interviewers, and admissions committee members who perceived the MMI format as effective for evaluating candidates’ nonacademic qualities was 65%, 86%, and 79%, respectively, and most agreed that the school should continue to use the MMI format instead of the standard interview (candidates, 59%; interviewers, 84%; admissions committee members, 77%). Cost analysis estimated a 45% reduction per applicant interviewed for MMI versus standard interview ($75.30 vs $136.34 per...
Fourth Year Pharmacy Students Use of Facebook to Learn About APPE Rotations. Jennifer Phillips, Midwestern University/Downers Grove, Jacob P. Gettin, Midwestern University/Downers Grove, Kristen L. Golliak, University of Illinois at Chicago, Sheila M. Allen, University of Illinois at Chicago, Maria Latovin, Midwestern University, Sean M. Mirk, Midwestern University/Downers Grove, Nancy Fjortoft, Midwestern University/Downers Grove. Objectives: To explore how students use social media to share information regarding Advanced Pharmacy Practice Experiences (APPE) rotations, using the workplace learning communities’ framework. Method: Fourth-year pharmacy students from two colleges of pharmacy in the Midwest were recruited by e-mail to participate. Inclusion criteria were: completion of two or more APPE rotations, currently completing an APPE rotation in the local area, and having a Facebook® profile. Two focus groups, of eight students each were conducted on each campus. An incentive to participate was provided to each student at the conclusion of the focus group. Investigators completed focus group training, and questions were developed and piloted. Data from transcribed audio recordings were analyzed using NVivo10® software. Results: Students indicated that they use Facebook® to learn about rotation expectations, roles/responsibilities, and preceptors, but they are hesitant about being too public with information they share and prefer to use more private methods of communication within or outside of these applications to learn about APPE experiences. Students found social media to be a good source of motivation and support in their final year. Implications: During APPE rotations, students are physically separated from peers and faculty, and are regularly required to navigate new environments. Formally or informally, students are utilizing social media sites to build virtual workplace learning communities to support them in their final year. Colleges may consider fostering these skills throughout their curriculum.

Highlights of a National Preceptor Development Survey Based on Practice Setting Preferences. Nora L. Stelter, Drake University, Maryann Z. Skrabal, Creighton University, Elizabeth A. Cardello, American Pharmacists Association, James Colbert, University of California, San Diego, Meri D. Hix, Southwestern Oklahoma State University, Mara A. Kieser, University of Wisconsin-Madison, Christina M. Seeger, University of the Incarnate Word, Robert L. Talbirt, The University of Texas at Austin, Kristin W. Weitzel, University of Florida. Objectives: To determine current state and needs of preceptor development training from preceptors in all practice settings involved in providing experiential education to student pharmacists. Method: Experiential Administrators were emailed a link to a web-based questionnaire and asked to forward the link to their preceptors. The survey assessed preceptors’ experience and future needs regarding training and development. Results were evaluated with additional analysis to determine significant differences between practice settings. Results: 4800 responses were received. Respondents represented the following practice settings: Health System or Hospital Pharmacy (32.2%), Acute Care (20%), Ambulatory Care (14.7%), Chain Community (19.9%), and Independent Community (11.6%). Community settings had higher preference for Hard Copy format of training materials, whereas Acute Care, Ambulatory Care, and Health System/Hospital settings all had higher preference for Live In-Person training. Community settings reported less improvement needed to preceptor development programs than others. Health Systems/Hospitals cited more time should be required for annual Preceptor Development Programs. Acute Care settings and Health System/Hospital settings precepted for more college/schools than Ambulatory and Community settings. Preference of development topics varied by practice setting and will be presented with complete results. Implications: Quality preceptors are essential to educate student pharmacists, so it is important to respond to their development needs and note significant differences in preferences by practice setting. These results will assist in guiding preceptor development across practice settings to assist preceptors in obtaining the training and development they most need. This, in turn, should provide higher quality precepting and education of future pharmacy professionals.

Impact of Advanced Pharmacy Practice Experiences (APPEs) on Student’s Interprofessional Beliefs, Attitudes, and Behaviors. Margarita V. DiVall, Northeastern University, Stephanie N. Amirana, Northeastern University. Objectives: We aimed to evaluate pharmacy students’ interprofessional beliefs, attitudes, and behaviors before and after APPEs using a validated Interprofessional Socialization and Values Scale (ISVS). Method: P4 students completed ISVS before and towards the end of their APPE year. ISVS is a 24-item instrument with 3 sub-scales: 1) self-perceived ability to work with others (9 items), 2) value in working with others (8 items), and 3) comfort in working with others (6 items). The ISVS asks respondents to rate the extent to which a belief, behavior, or attitude is present, using a 7-point Likert scale (1 = not at all to 7 = to a very great extent). Pre and post responses were matched with a unique student identifier and compared using Wicoxon Signed Ranks test. Results: 126 (85%) students completed the pre-survey and 129 students (87%) completed the post-survey; 109 (74%) students had matched data. Overall, the P4 students showed a statistically significant improvement (P<0.05) on all but 7 items (2 in sub-scale 1, 4 - in sub-scale 2, and 1 - in sub-scale 3). Average ratings on items that did not demonstrate significant change over time were higher at baseline than other items in each sub-scale. Average rating for all items on sub-scale 1 increased from 5.84 to 6.23, on sub-scale 2 from 5.78 to 6.11, and on sub-scale 3 from 5.19 to 5.50. Implications: Clinical practice experience has further impact on students’ interprofessional beliefs, attitudes, and behaviors. The ISVS scale may be a useful tool to measure students’ interprofessional attitudes throughout the didactic and experiential learning.

Impact of Decision Making Style Preference on Advanced Pharmacy Practice Experience Performance. Greene Shepherd, University of North Carolina at Chapel Hill, Jacqueline McLaughlin, University of North Carolina at Chapel Hill, Charlene Williams, University of North Carolina at Chapel Hill, Wendy C. Cox, University of North Carolina at Chapel Hill. Objectives: To determine if student pharmacists’ preferences towards experiential (intuitive) and rational (analytic) thinking are associated with performance on advanced pharmacy practice experiences (APPEs). Method: The Rational Experiential Inventory (REI), a validated survey tool that evaluates a person’s decision making style based on experiential and rational thinking, was administered to 114 third year student pharmacists prior to starting APPEs. APPE grades measured on a scale of 0-100 were collected over a 6 month period. For each student, Pearson correlation was used to compare REI scores with average APPE grade. Sub-analyses by APPE type (community, hospital, adult acute care, ambulatory care, clinical specialty or elective) were also performed. Regression analysis was used to control for decision making style, age, gender, and prior degree status. Results: There were no significant relationships found between average APPE grade and REI experiential and REI rational scores. However, a negative relationship was found between hospital APPE grades and REI experiential scores (r = -0.36). When placed
into the regression model, the REI experiential score was a significant negative predictor of hospital APPE grades ($p = 0.01$). **Implications:** Student pharmacist decision making style is not associated with overall APPE performance. This finding suggests that overall APPE performance is independent of decision making styles and that preceptors should use pedagogical strategies that engage and develop intuitive and analytic thinking skills. However, highly intuitive students in hospital APPEs may warrant closer attention. Future research should focus on the REI-hospital APPE relationship and examine change in REI scores following APPEs.

**Implementing the Critical thinking Assessment Test (CAT) Across a Pharmacy Curriculum: A Preliminary Analysis.** Janelle L. Krueger, University of Wyoming, Kem P. Krueger, University of Wyoming, Linda G. Martin, University of Wyoming. **Objectives:** Critical thinking is an important outcome of pharmacy education as well as higher education in general. In 2011, the University of Wyoming School of Pharmacy began administering the Critical Thinking Assessment Test (CAT©), a validated 15 question short-essay test scored by local faculty. The purpose was to obtain baseline data regarding students’ critical thinking abilities, determine if scores improved with curricular progression and identify areas for skill improvement. **Method:** The CAT© is administered at three points in the curriculum—program entrance (P1s), the end of didactic coursework (P3s) and at graduation (P4s). Questions test specific critical thinking skills and are mapped to four domains. To date, six CAT© administrations (two from each time frame) have occurred as part of this longitudinal study. **Results:** Mean total scores for each student cohort were higher than national CAT© norms for undergraduate juniors and seniors (19.04) and statistically significant except for one P3 class. Mean total scores increased across the curriculum with P4s scoring higher (23.76) than P3s and P1s (22.02 and 21.38, respectively). Aggregate results for individual questions were also equal to or above the national average for all but two questions. The poorest performing question, designed to “use and apply relevant information to evaluate a problem”, had three cohort groups scoring lower (statistically significant) than the national norm. **Implications:** The CAT© has provided preliminary information regarding students’ critical thinking abilities and insight regarding student strengths and where these skills can be enhanced.

**Institutional Pharmacists’ Perspectives on Precepting: A Comprehensive Province-Wide Study.** Peter S. Loewen, The University of British Columbia, Peter Zed, The University of British Columbia, Donna Rahmatian, The University of British Columbia, Kyle Collins, The University of British Columbia, Patricia A. Gerber, The University of British Columbia, Angela Kim-Sing, The University of British Columbia, Michael Legal, The University of British Columbia. **Objectives:** To characterize the perspectives of institutional pharmacists, identify potential solutions to capacity challenges and to find ways to better support preceptors and learners. **Method:** Pharmacist perspectives were gathered using a mixed methods approach. An online survey was deployed to all hospital pharmacists in BC. In addition, focus groups and structured interviews were conducted across the province. The survey utilized a combination of likert, ranking, multiple-answer, and open field responses. Focus groups and interviews were recorded and the resulting transcripts were analyzed using qualitative methods and iterative coding to identify major themes. **Results:** A total of 233 pharmacists responded to the survey and over 200 participated in the focus groups and interviews. Pharmacists indicated that teaching is an important professional role and they appear to be intrinsically motivated to precept. Workload, lack of time to teach, inadequate staffing, lack of faculty support and unprepared learners were major barriers. Participants identified a need to strengthen the curriculum to increase learner exposure to institutional practice and to enhance their practice-readiness. Human resource support was the most desirable solution for workload issues. Multi-learner models were viewed favourably as a capacity solution but increased teaching workload and limited physical space were concerns. A more robust relationship with the faculty was also desired. **Implications:** This project highlighted some key challenges faced by preceptors and suggests some possible solutions. These solutions will require collaboration and commitment by all parties to ensure success.

**Intention/Reflection Practice in Pharmacy Education.** Gardner A. Lepp, University of Minnesota, Kerry K. Fierke, University of Minnesota. **Objectives:** To improve student learning outcomes by defining learners’ intentions and expectations of the learning experience, and stimulating reflection of that experience. Ultimately, the Intention/Reflection (I/R) practice described herein can be used to promote and sustain lifelong learning for pharmacists. **Method:** A short series of questions was administered to student volunteers before and after conducting a health fair at the Minnesota Children’s Museum. This evidence-based set of questions helps to identify what, how, and why the student is engaging in the learning experience, and how they will use what they’ve learned in the future. **Results:** 25 students completed both sets of questions (pre- and post-event). When asked, “How has this Intention/Reflection activity been helpful in enhancing your experience?” 22 out of 25 (88%) students indicated a positive response. (The other 3 responded as if the question were related to the activity with the children.) Examples of responses include: “This will influence my path in the future. I’m learning what I like and don’t like.” “It helped me to have a clear goal for my interactions with the kids.” “This reflection allows me to identify what went well and what we can improve for next time.” **Implications:** This research-based Intention/Reflection practice has been repeated with diverse groups of adult learners. Learning outcomes include: improved engagement, identification of interests/motives, and identification of areas for continuous improvement. Research continues on the I/R practice, and how it affects pharmacy student learning.

**Interactive Web-based Training Modules Prior to Advanced Pharmacy Practice Experiences.** Sarah Nisly, Butler University, Alex N. Isaacs, IU Health, Alison Walton, Butler University. **Objectives:** Implement and evaluate interactive web-based training (WBT) modules prior to an ambulatory care or general medicine advanced pharmacy practice experience (APPE). **Method:** Six WBT modules were developed, three for an ambulatory care APPE (outpatient anti-coagulation, diabetes, medication therapy management) and three for a general medicine APPE (inpatient anticoagulation, pneumonia, antibiotic pharmacokinetics and pharmacodynamics). Students were contacted for voluntary study enrollment 10 days prior to the APPE. Students were eligible for inclusion if they were enrolled in an ambulatory care or general medicine APPE facilitated by a Butler University faculty member. Students were excluded from analysis if they had participated in the WBT modules on a previous APPE or did not complete all study components. Students completed identical pre- and post-assessments to evaluate the efficacy of the modules. Additionally, students completed a perception survey at the conclusion of the APPE to determine the utility of this learning assessment. **Results:** A total of 49 students completed both the pre- and post-assessments, with 100% (20/20) ambulatory care students and 65.9% (29/44) general medicine students completing all study components. The ambulatory care APPE modules pre- and post-assessment scores were
66.4% and 77.7% respectively. For the general medicine APPE modules, assessment scores increased from 30.1% during the pre-assessment to 63.6% during the post-assessment. A majority of participants agreed or strongly agreed that the WBT modules supplemented the APPE and were a positive learning experience. 

**Implications:** Implementation of interactive WBT modules prior to an APPE improved baseline knowledge and were a beneficial learning experience well received by pharmacy students.

**Lessons Learned in Implementing a Geriatric Care Introductory Pharmacy Practice Experience (IPPE).** Gretchen I. Riker, University of Maryland Eastern Shore, Frederick R. Tejada, University of Maryland Eastern Shore. **Objectives:** Develop a longitudinal eight-week IPPE rotation in a nursing home setting in order: (1) to provide students with unique experiences in direct patient care, and (2) to develop a greater appreciation for the complexity of geriatric care. **Method:** A pilot rotation was developed and implemented in a local nursing home involving six second-year pharmacy students. Students were assigned to a resident and met with them once a week over the course of the semester. This meeting involved getting to know the patient outside of their medical conditions and therapies. Students wrote reflections throughout the rotation. Supplemental activities were created to enhance their comfort and confidence in providing care for older adults. Students completed a pre- and post- survey to show the impact of the rotation. Reflection and survey results were used to implement changes for a second semester of the rotation, which involved twelve students. **Results:** Positive survey responses showed that the pilot rotation was successful in increasing students’ ability to provide medication education in older adults. However, minor improvement was observed on providing drug utilization reviews in older adults. Thus structured activities integrating clinical and pharmaceutical sciences, related to older adults, were implemented in the second semester. These activities offered students opportunities to develop a stronger appreciation, confidence, and knowledge when working with the geriatric population. **Implications:** The geriatric care IPPE increases student appreciation for complex geriatric patients. It will continue and grow, with the goal of being a required rotation for all second-year pharmacy students.

**Longitudinal Examination of Professional Service and Leadership Introductory Pharmacy Practice Experiences.** Jeanine Abrons, Laura Umlahl, The University of Iowa, Susan S. Vos, The University of Iowa, Jennifer L. Seyfer, The University of Iowa, Jenna Lensmeyer, The University of Iowa, Susan S. Vos, The University of Iowa. **Objectives:** * To describe trends in student participation in a course, incorporating professional service and professional leadership experiences over three years of pharmacy curriculum. * To evaluate sustainability of offering Introductory Pharmacy Practice Experiences (IPPE) credit for professional service and leadership experiences. **Method:** One component of the IPPE curriculum allowed students to participate in professional service learning and professional leadership learning experiences. Students were required to complete a minimum of 32 hours of professional service and professional leadership experiences with a minimum of 10 hours in each area. All hours were supervised by a pharmacist preceptor or faculty member and were recorded using an online system. **Results:** From September 2007 to May 2013, 663 students completed over 15,000 professional leadership hours (10,732 activities) and nearly 7000 professional service hours (2516 activities). For service learning experiences, students participated in immunization clinics, cardiovascular screenings, and bone density screenings with the highest frequency. The most commonly reported leadership experiences were student organization meetings, state pharmacy association events, and regional and/or national meetings. Average participation to date of 1 hour 56 minutes in leadership experiences and 2 hours 33 minutes in service experiences was recorded. **Implications:** Longitudinal analysis confirmed sustainability of program structure and components. All students met minimum requirements, although many students stopped reporting activities once requirements were met. Promotion of benefits of continued documentation of hours will be a focus for continued development of the course.

**Multicenter Assessment of APPE Placement Changes: An Examination of Reasons, Affected Courses, Timing and Workload.** Lori J. Duke, The University of Georgia, April Staton, Auburn University, Elizabeth S. McCullough, Sanford University, Regina L. Parham, C. Lea Bonner, Mercer University, Lynn Stevenson, Auburn University. **Objectives:** To measure the annual number of APPE changes, identify the characteristics of the changes (initiating reason, timing, affected rotations), and quantify the corresponding administrative workload for experiential offices associated with four southeastern Colleges / Schools of Pharmacy. **Method:** Participating institutions were comprised from members of the Southeastern Pharmacy Experiential Education Consortium (SPEEC). Each institution utilized a data tracking form within the E*Value database system. The collection period extended from the date each institutional schedule was considered complete through the conclusion of the 2012 – 2013 academic year. **Results:** Rotation changes occurred in 25.7% of rotations (1182 of 4607). Initiating reasons for changes were preceptor (52.6%), school/administrative (24.6%), student (17.2%), and site (5.6%). The most common courses replaced were acute medicine (30.7%), community (22.6%), and ambulatory care (16.7%). Workload estimates for staff and faculty were 266.3 hours and 134.7 hours respectively. The average number of changes per block increased throughout the study timeframe and was as follows: 69 (blocks 1 – 3), 116 (blocks 4 – 6), and 184 (blocks 7 – 9). **Implications:** APPE student placements are dynamic and subject to a high rate of instability, particularly in the latter part of the academic year. The majority of changes (58.2%) were initiated by preceptors or sites and most often affected acute medicine (medicine/medicine subspecialty) experiences which are traditionally difficult to replace. With competition for sites expected to remain at current levels or potentially worsen, it is likely that securing replacement APPEs will continue to be a challenging and time-consuming process.

**Personalizing APPE Rotation Selection: Capturing Patient Encounters at Ambulatory Care and Community Sites.** Jennifer L. Bacci, Melissa A. Somma McGivney, University of Pittsburgh, James J. Pshirer, University of Pittsburgh, Samantha S. Martin, University of Pittsburgh, Deanne L. Hall, University of Pittsburgh, Karen S. Pater, University of Pittsburgh, Kim C. Coley, University of Pittsburgh. **Objectives:** To capture APPE students’ patient encounters and determine how this information informs incoming APPE students’ selection decisions. **Method:** Previously APPE students documented patient encounters on paper. An electronic documentation system was implemented in July 2012. Data on patient encounters occurring between May and December 2013 at ambulatory care and community APPE sites was extracted. In phase 1, this data was analyzed using descriptive statistics and provided to incoming APPE students via the rotation selection software. Phase 2 of this study will involve conducting focus groups to identify how the data influenced site selection decisions. **Results:** There were 16 ambulatory care and 6 community sites representing 113 student rotations. The average number of patients seen over a 5 week period was 33 (range, 17-137) at ambulatory care sites.
and 31 (range, 17-40) at community sites. The majority of patient encounters were medication assessment/reconciliation (8 sites) and Collaborative Drug Therapy Management (4 sites). At 6 sites, patients with diabetes were most commonly evaluated followed by anticoagulation at 4 sites. Patient device training included blood glucose monitor (16 sites), inhaler/peak flow (12 sites), injection technique (11 sites), and home blood pressure monitor (10 sites). Vaccinations were provided at 8 sites and 13 sites billed for patient care services. Implications: An electronic documentation system facilitates real-time data collection and curriculum assessment. Assessing and providing patient encounter data to students may allow them to personalize their education and select APPEs to match their career interests and knowledge/skill deficits.

Preceptor Recruitment, Training, and Retention – A Nationwide Survey of Colleges of Pharmacy. Erin L. Johanson, Roseman University of Health Sciences. Objectives: The purpose of this study was to identify what strategies the American Association of Colleges of Pharmacy Experiential Education Section members utilize to recruit, train, retain, and acknowledge volunteer pharmacist preceptors. Method: This study utilized a survey design methodology with thirteen quantitative survey items as well as eight open-ended commentaries allowing for qualitative analysis to address the research questions. Active members of the AACP Experiential Education Section were voluntarily surveyed and 233 participants answered using online survey collection in the summer of 2013. Quantitative results were reported in descriptive statistics of frequencies, number counts, and percentages. Qualitative results were reported as direct quotes from the written commentary of respondents. Results: Demographic information gathered showed respondents were relatively equally dispersed geographically and in terms of funding. Recruitment efforts varied. Primary methods were word-of-mouth, site visits, alumni, volunteers, and pharmacy and hospital system contacts. Preceptor training methods reported were most commonly done online, in-person and on-campus at the college. Acknowledgements reported highest percentages and frequencies for financial compensation to the practice site, free CE credits, Preceptor of the Year Award, certificates, library or online drug information resources, thank you letters or cards, and adjunct faculty appointments. Implications: Conclusions and recommendations revealed opportunity for future research and development as challenges continue in terms of meeting the quality and quantity of rotation practice sites necessary to support the experiential component of an accredited Doctor of Pharmacy curriculum.

Preparing the Future Pharmacists to Achieve the National HIV/AIDS Strategy (NHAS) Goals. Neha S. Pandit, University of Maryland, Alexandre Reitz, The JACQUES Initiative, Institute of Human Virology of the University of Maryland- School of Medicine, Jamie L. Mignano, The JACQUES Initiative, Institute of Human Virology of the University of Maryland School of Medicine. Objectives: The NHAS goals include reducing new infections and HIV-related health disparities, increasing access to care and improving health outcomes by undertaking a more coordinated response. We implemented a course with the objective to prepare future pharmacists to achieve the NHAS goals through an interdisciplinary approach. Method: The course, entitled “Preparing the Future”, provided medicine, nursing, pharmacy, dentistry, social work and law students with a didactic (DLC) and service learning component (SLC). Pharmacy students were required to attend 4 DLCs including 3 interprofessional workshops (HIV 101, case conferences, and cultural competency to address health disparities) and pharmacy-specific sessions for reflection. Students were also required to attend interprofessional SLCs where they applied skills learned in the DLCs in the community. Students completed a pre- and post-test that included an assessment of knowledge/attitudes/behaviors towards the HIV epidemic. Results: In academic year 2012-2013, 129 students completed the pre- and post-test; 17 were pharmacy students. By the end of the course the number of pharmacy students who felt 1) competent to discuss HIV with their patients; 2) that it wasn’t too complicated to offer an HIV test as part of routine care; and 3) comfortable talking to patients regarding HIV risks increased by 53%, 12.5%, and 25%, respectively. Similar increases were seen for all disciplines (50.4%, 11.9% and 25.9%, respectively). Implications: As pharmacists are the most accessed point of healthcare it is important for them to feel competent to address the HIV epidemic in order to empower them to help achieve the NHAS goals.

Relationship between StrengthsFinder 2.0 Leadership Domains and Student Pharmacist Perceived Capabilities to Perform Leadership Skills. Linda D. Hughes, The University of Georgia, Lindsey H. Welch, The University of Georgia, Ashley Hannings, The University of Georgia, Michael J. Fulford, The University of Georgia. Objectives: To explore the relationship between student pharmacist’s leadership strengths and their confidence in performing leadership skills using the StrengthsFinder 2.0 Assessment (SFA) and a modified version (40 out of 123 items) of the National Center for Healthcare Leadership’s Life-long Leadership Inventory™ (LLI). Method: P3 students completed the SFA and the LLI™ at the beginning of leadership training incorporated into an Introductory Pharmacy Practice Experience (IPPE). The SFA identified student’s strengths. Each student was assigned a primary leadership domain of Executing (E), Influencing (I), Relationship Building (R), or Strategic Thinking (S) using the model presented in Rath and Conchie’s Strengths Based Leadership. Students rated each item on the LLI™ to rank their capability to perform each leadership skill in the inventory. Average ratings on the LLI™ were evaluated by StrengthsFinder 2.0 leadership strength domains. Results: 102 students participated in the study and fell into the following domains: R (47.1%), E (31.4%), S (15.7%), and I (5.9%). Students in the Relationship Building Domain ranked their leadership capabilities lower than other groups on more occasions (20 out of 40). Students in the Relationship Building domain rated themselves somewhat to moderately capable in half of the leadership skills compared to their peers, who rated themselves very to extremely capable. Implications: These results indicate that students in the Relationship Building domain may exhibit less confidence in leadership skills. Since nearly half of the student pharmacists surveyed were in this domain it may indicate a need to use assessments like StrengthsFinder and LLI™ to develop intentional leadership experiences.

Retrospective Review of Selected Benchmarks for the Student Capstone Research Experience. Cynthia A. Wuller, Southern Illinois University Edwardsville. Objectives: To provide a retrospective review of student capstone projects focusing on the benchmarks of final grade and study design and to determine if the study design has an impact on the final grade for the experience. Method: The capstone research experience consists of four components: the Advanced Pharmacy Practice Experience (APPE) Preparation class, a five week APPE rotation to complete the research under the guidance of a mentor, a written manuscript and a poster presentation. A log was kept from 2009 through 2013 as to the final grade for the project and the type of study design for each project. Results: Over the five years, 389 students completed the capstone experience. Study designs included: survey 152 (39%), retrospective chart review 129 (33%), business plans 61 (16%), bench research 23 (6%) and other 24 (6%). Grade distribution is as follows: survey projects 107 (71%) A, 40 (26%) B.

Objectives: To document the students’ perception of academic and professional growth in a Healthcare Service-Learning IPPE at the Jefferson School of Pharmacy. Method: Students who completed a one semester P1 Service-Learning IPPE between Falls 2011-2013 at either of two sites in Philadelphia, PA (Charter School and Youth Emergency Services), were invited to complete a retrospective survey regarding initial and final perceptions of development and future applications of skills. IPPE activities included: patient counseling, oral and written presentations and identification of gaps regarding treatment, medication administration, safety, adherence, health literacy, cultural sensitivity and health awareness. Results: Eighty-six percent of the students participated (25/29). 88% reported starting the experience not at all to slightly familiar with the site environment and 56% did not know how to contribute to the improvement of care, organization or education in that facility. These perceptions changed to being somewhat to extremely familiar (80%) with the environment and 92% understanding how they could make a contribution; 92% were likely to extremely likely to apply lessons learned in future pharmacy practices and appreciated the unique experience. Regarding perceptions of their own professional development, 84% reported improvement of written and verbal communication skills. 88% agreed or strongly agreed with perceived development of concepts of cultural sensitivity health literacy, health awareness, disease prevention and lifestyle modification. Implications: These findings validate the benefit of this Service-Learning course in strengthening knowledge, skills, and perceived improvement in experiential education. This academic growth can serve as a solid foundation for future pharmacy application.


Objectives: To compare the attitudes of students toward the practice of Medication Therapy Management (MTM) before and after an Advanced Pharmacy Practice Experience (APPE) at the University of Florida (UF) MTM Communication and Care Center (MTMCCC). Method: Student pharmacists were administered a validated survey on students’ perceptions of MTM services on both the first and last day of their APPE. The 2-month APPE allowed for the provision of interactive and autonomous telephonic MTM services. The survey consisted of 22 MTM-related questions: 12 addressed ability outcomes, 3 addressed future plans, and 7 addressed beliefs related to the provision of MTM services. Student responses to these questions were scored on a five-point Likert scale from strongly agree to strongly disagree. The results from the survey data were compiled and evaluated to identify changes in student responses before and after the APPE at the MTMCCC. Results: All post-APPE scores increased, suggesting improvement in the students’ abilities, future plans, and beliefs regarding MTM. Statistical significance was shown in all but four questions. The statement “I am confident in my ability to formulate a medication action plan (MAP)” displayed the greatest improvement from pre to post APPE (3.463, 4.854 respectively). The statement with the second most improvement was “I am confident in my ability to identify medication problems after completing a telephonic MTM comprehensive medication review” (3.390, 4.610 respectively). Implications: The APPE at the UF MTMCCC offers learning experiences that can positively influence students’ future plans involving MTM, their ability to perform MTM, and their beliefs regarding MTM.

Student Pharmacist Perceptions of Capability to Perform Leadership Skills versus Importance to Future Career Success. Linda D. Hughes, The University of Georgia, Lindsey H. Welch, The University of Georgia, Ashley Hannings, The University of Georgia, Michael J. Fulford, The University of Georgia.

Objectives: To identify gaps in student-perceived capability of specific leadership skills and the perceived importance of those same skills for future career success using a modified version (40 out of 123 items) of the Lifelong Leadership Inventory™ (LLI) developed and validated by the National Center for Healthcare Leadership. Method: P3 students completed the LLI at the beginning of leadership training incorporated into their Introductory Pharmacy Practice Experiences (longitudinal ambulatory care). Students rated each item on the survey using a 10 point Likert scale in order to rank their capability to perform the skill and its importance to their future career success. Results: 102 completed the survey and a paired samples t-test was conducted to compare the difference in the means between capability and importance. Results of the paired samples t-test showed statistically significant differences in students’ ratings of capability and importance on all 40 items (p<0.05). For all items measured, the mean ratings for importance were higher than the ratings for capability. Implications: This study identified a gap between student perceptions of their capability to perform leadership skills and their importance to future career success. Using tools like the LLI, PharmD programs can identify these gaps and incorporate leadership components into their curricula in order to meet the Center for the Advancement of Pharmacy Education (CAPE) Outcomes developed by AACP. These leadership components are essential in developing student pharmacists into future healthcare leaders.
Teaching Cultural Humility and Social Awareness through Service Learning. Nancy A. Mason, University of Michigan, Anica Madeo, University of Michigan, Vidya Ramaswamy, University of Michigan. Objectives: To examine the impact of a required, first-year service-learning (SL) experience in underserved populations on development of students’ cultural humility, awareness of social determinants of health and ability to communicate with diverse populations. Method: SL course objectives include development of communication, cultural sensitivity, and professionalism skills as well as learning core concepts related to public health, insurance/precription drug coverage, and civic engagement. Service placements focus on the health experiences of individuals with limited access to health care. Course assessment included pre- and post-course surveys regarding beliefs and attitudes toward community service, service learning, cultural humility, and self-assessed learning gains. Qualitative analysis using the grounded theory approach evaluated the students’ end-of-semester final reflections. Results: Pre-post surveys revealed significant changes in students’ understanding of the importance of social services and their knowledge of resources for underserved patients. Self-assessed learning gains were demonstrated in communication ability, sensitivity to diverse clients, and ability to identify barriers contributing to health disparities. Qualitative analysis revealed what the students learned in the areas of communication, social determinants of health, advocacy and role identification, cultural humility, and the role of strong mentors in their service placements. It also revealed how students were learning, namely through reflecting on real-life experiences that challenged their assumptions, forced them out of their comfort zones, and resulted in a true sense of professional gratification. Implications: The outcomes of this study suggest that service-learning is a uniquely impactful pedagogy for teaching cultural humility, communication skills, and public health concepts to pharmacy students.

The Impact of an Assigned Leadership Model on Student Self-Evaluation Scores in an IPPE. Lindsey H. Welch, The University of Georgia, Linda D. Hughes, The University of Georgia, Ashley Hannings, The University of Georgia, Michael J. Fulford, The University of Georgia. Objectives: To evaluate student perception of leadership growth and development when assigned as the leader of a patient care team in an Introductory Pharmacy Practice Experience (IPPE). Method: Student pharmacists were assigned to patient care teams in a longitudinal ambulatory care IPPE during the third professional year. Each student was designated as the team leader for two separate patient visits over the course of the IPPE. Leadership responsibilities included delegating tasks, ensuring group preparedness for patient visits, ensuring accuracy of assignments, and meeting assignment deadlines. Following each visit, the student leader completed a 15-item self-evaluation of their performance using a 4-point Likert scale. Results: Fifty-one students completed two patient encounters as the team leader. A paired samples t-test was conducted to compare student self-evaluation scores from the first visit as leader to the second visit as leader. There was a significant improvement in the means on 5 items in the self-assessment (p < 0.05) including working to resolve problems, delegating tasks, holding others accountable, recovering quickly from unexpected problems, and providing helpful feedback to others. Implications: This model for leadership experience can be used to meet the 2013 Center for the Advancement of Pharmacy Education (CAPE) Outcomes which emphasize the need for leadership development in the pharmacy curriculum. Allowing students multiple opportunities to practice leadership skills and to reflect on their performance of those skills can increase confidence in some areas of leadership.

The Use and Impact of Preceptor Feedback during Introductory Pharmacy Practice Experiences. Scott S. Wisnieski, Northeast Ohio Medical University, Aleta N. Smithbauer, Northeast Ohio Medical University, Elizabeth Legros, Northeast Ohio Medical University. Objectives: To explore the student’s expectations, experience, and impact in relation to preceptor provided feedback during an IPPE. Method: An IRB approved validated 26-item paper survey was administered to students (N = 58) following the completion of their three P2 IPPEs (64 hours each, 192 hour total). The survey consisted of Likert scale and open-ended type questions divided among the three domains of expectations, experience, and impact of feedback they received from their preceptors during the IPPEs. Results: A total of 57 (98%) of students (51% female, 49% male) completed the survey. Students preferred feedback is given verbally instead of written (91%), immediately following a task (77%), include both positive aspects and areas of needed improvement (98%), and be specific with relevant examples (95%). Students indicated the feedback received was prompt (81%), clear (74%), specific (58%), and relevant (84%). Students (83%) indicated that the feedback motivated them to learn new and improve their existing skills. Students felt the impact of the feedback was affected by their perception of the preceptor (74%) and of themselves (79%). Implications: Students have high expectations for the feedback they receive from their preceptors and are motivated to utilize it to aid in their professional development. This study provides an opportunity for the college to encourage preceptors to provide effective feedback to their students with the goal to improve the quality of the experiential program.

Using the Critical Thinking Assessment Test (CAT) as a Curricular Assessment Tool. Janelle L. Krueger, University of Wyoming, Kem P. Krueger, University of Wyoming, Linda G. Martin, University of Wyoming. Objectives: To determine if critical thinking scores 1) change across the curriculum and 2) are correlated with admissions and academic performance data. Method: The Critical Thinking Assessment Test (CAT) is a validated 15 question short-essay test developed through National Science Foundation funding. Test administration occurs at three junctures in our pharmacy curriculum—beginning of P1 year, end of P3 year, and conclusion of P4 year. Six administrations have occurred with one class taking the CAT longitudinally (P3 and P4 years) and the others representing independent samples of P1, P3 and P4 classes. CAT total scores and sub domain scores (Evaluation and Interpretation, Problem Solving, Creative Thinking, and Effective Communication) were obtained. Correlation analysis, the general linear model, and repeated measures ANOVA were used for data analysis. Results: CAT total scores improved over the curriculum (p = 0.048) and were correlated with the PCAT Composite (p < 0.0001), Biology (p < 0.0005), Math (p < 0.0001), Reading (p < 0.0001) and Verbal scores (p < 0.0001). Students terminated for poor academic performance had lower CAT Creative Thinking and Effective Communication scores than other students (p = 0.027 and p = 0.033 respectively). Students with previous degrees had higher CAT Evaluation and Interpretation, Problem Solving, and Effective Communication scores compared to other students (p = 0.048, p = 0.048 and p = 0.032 respectively). After the P4 year, the longitudinal group had improved CAT total, Evaluation/Interpretation, and Problem Solving scores (p = 0.014, p = 0.003 and p < 0.001 respectively). Implications: Problem solving and critical thinking are incorporated into the draft ACPE Standards 2016. The CAT appears promising as an effective assessment tool across the curriculum.
Theoretical Models:

Creative Strategy for Integrating Self-Care Into Introductory Pharmacy Practice Experiences. Ahmed Abdelmageed, Manchester University College of Pharmacy, Mary E. Kiersma, Manchester College School of Pharmacy, Abby L. Todt, Manchester University College of Pharmacy. Objectives: Design and implement Introductory Pharmacy Practice Experiences (IPPEs) that integrate self-care topics in both the didactic and experiential settings. Method: Students are required to complete 2 weeks of an introductory pharmacy practice experience (IPPE) with a focus on the community setting in the winter semester of their P1 year followed by longitudinal experiences (4 hours/week) in the spring semester. A workbook was designed to bridge concepts taught during lecture with real-life experiences encountered in the community pharmacy setting and reinforce the desired outcomes of the course. Four exercises that comprise the self-care section of the workbook were designed to be in accordance with the self-care objectives of the didactic Nonprescription Therapeutics course. Results: This structure allows for consistent integration of didactic and experiential learning. The first 3 weeks of the longitudinal portion of the IPPE in the community setting consist of workbook exercises that utilize two forms that help guide students through how to properly evaluate and counsel patients on available over-the-counter (OTC) products. Students then shadow their preceptor counseling a patient on an OTC product and compare the preceptor’s techniques with what they have been taught in class/lab. Implications: Strategic integration of IPPEs within the academic year provides relevance and motivation for didactic learning and prepares students well for meaningful experiential learning.

Incorporating Inter-professional Education Activities throughout an IPPE Curriculum. Gina M. Baugh, West Virginia University, Lena M. Maynor, West Virginia University, Travis White, West Virginia University. Objectives: (1) To discuss IPE activities included in the first, second, and third year IPPE (2) To provide results and future plans of these IPE activities Method: First and third year pharmacy students take part in an inter-professional My First Patient program with the schools of Dentistry and Medicine. Second year pharmacy students are involved in year-long service learning course that has a required inter-professional component. Third year students complete an inter-professional acute care experience with the schools of Medicine and Nursing. Results: A total of 262 first year dental, medicine, and pharmacy students were screened by 121 upper-level dental, medicine, and pharmacy students as part of the My First Patient Program in fall 2013. Follow-up visits were conducted with the schools of Medicine and Pharmacy. Eighteen service-learning projects were completed by 86 second year pharmacy students working in teams of 4-6. They worked with nine different disciplines with a majority being nursing (8), dentistry (6), and medicine (4). Teams that consisted of 2nd year student pharmacists, one third year medical student, and 2 fourth year nursing students completed inter-professional acute care activities. A total of 233 students completed the activity during the 2012-13 pilot year. 86% of students responded that this IPPE experience was valuable to their professional growth. Implications: Students are exposed to inter-professional education activities throughout all 3 years of the IPPE curriculum. These experiences will help them to understand the roles of other healthcare providers and prepare them for their APPEs and future careers.

Mirroring tenure track requirements for preceptor advancement in Experiential Education. Yes, they do like the idea. Tonya A. Dauterman, The University of Findlay, Katherine Cochran, The University of Findlay. Objectives: The objective was to design a promotional structure for preceptors who take students in experiential education in order to better identify and provide recognition for preceptors dedicated to experiential education. Method: After a review of current ACPE standards, University’s tenure requirements, and approval from experiential advisory board, long-term goals for preceptor advancement were identified. The specific criteria chosen were intended to mimic tenure requirements for on-campus faculty. The criteria include: years of practice, number of students taken, preceptor evaluation scores, preceptor training, scholarship and service, and teaching beyond experiential precepting. The titles that can be earned are as follows: University of Findlay Preceptor, Affiliate Assistant Professor of Pharmacy Practice, Affiliate Professor of Pharmacy Practice, Affiliate Associate Professor of Pharmacy Practice and Affiliate Senior Professor of Pharmacy Practice. Preceptors collect and submit supporting documentation of achievement through an online experiential management program. Preceptor submissions are reviewed review by the Experiential Education Directors. A certificate is then awarded in title during the fall preceptor training session. Results: In January of 2014, our experiential advisory board and faculty approved the preceptor promotion structure to provide professional advancement titles to our preceptors. Already, four preceptors are ready to advance into the next level. Implications: The promotion system provides encouragement for preceptors to continue their professional development in the area of experiential teaching. Providing title incentives and recognition for preceptors with a positive proven track record will allow the experiential office to better identify preceptor who are committed in experiential teaching.

One Hundred Eighty Thousand Minutes or Two Thousand Hours; How Do You Measure a Year. Lisa Lebovitz, University of Maryland, Natalie D. Eddington, University of Maryland, Magaly Rodriguez de Bittner, University of Maryland, Andrew Coop, University of Maryland, William J. Cooper, University of Maryland, C. Daniel Mullins, University of Maryland. Objectives: The objective of this project was to facilitate a collaborative process for University of Maryland School of Pharmacy (UM SoP) faculty to devise criteria to quantify their workload to help inform annual assignments and reviews. Method: The UM SoP’s three department chairs embarked on a pilot project to reach consensus on common criteria (i.e., how many hours to award to each workload activity) to measure various components of teaching, research, and service/practice. Other points of discussion critical to the pilot project were agreeing on the number of hours in a work year and identifying objective sources for the data. After testing the chairs’ criteria with data for three years, the faculty were surveyed for their perceptions on various criteria and measurements, both in hours and percentages of FTE. The faculty criteria were tested with data and presented at department meetings. Results: Despite the fact that many of the approximately 90 faculty at UM SoP from disciplines of professional clinical practice, bench science and outcomes research were aware of the department chairs’ pilot project, AACP survey results indicated that some faculty perceived unbalanced workloads and a lack of clarity in allocation of effort and performance assessment criteria. Awareness and clarity have improved as a result of the recent collaborative process. Implications: Potential implications of this project could include testing the process in other schools of pharmacy to establish external peer benchmarks. This process could be used for the effective determination and measurement of graduate and professional practice faculty workload in PharmD programs.

between programs. Due to the lack of comparative studies, it can be challenging to implement an approach that is both validated and successful. In higher level courses such as Therapeutics, an effective remediation plan can provide support to struggling students and aid in identifying unsuccessful students. This poster demonstrates an approach to remediation for the Therapeutics series in a 3-year, accelerated Doctor of Pharmacy program and outlines benefits for residents involved in implementation of the plan. Method: Students who did not successfully complete a quarter of Therapeutics were placed in an intense 1-2 week remediation plan that included mandatory study sessions and a post-remediation examination. The sessions were designed and led by a pharmacy resident on an academic elective rotation. The resident designed the remediation plan based on topics covered in the previous quarter of Therapeutics, and the study sessions were conducted using various teaching methods. Oversight for all sessions was provided by an appropriate faculty mentor. Results: Students completing the remediation plan gained essential knowledge that will allow them to be successful in the remainder of their pharmacy education. The resident was able to address the topics more thoroughly, refine their personal teaching skills, and overcome potential language barriers that are common in pharmacy education. Implications: This information provides an interesting basis for remediation plans in accelerated Doctor of Pharmacy programs. Research could be conducted to determine the effectiveness of such a process on student remediation outcomes.

LIBRARY AND INFORMATION SCIENCE

Completed Research:

A Graduation CAPP: Automated Graduation Course Auditing for Pharmacy Programs. Shannon R. Tucker, University of Maryland, Jill A. Morgan, University of Maryland, Cherokee Layson-Wolf, University of Maryland. Objectives: The objective of this project was to implement an automated graduation auditing system to accommodate curricular change and decrease workload. Method: While curriculum revision provides programs with an opportunity to stay current with changing landscape of healthcare, its implementation presents a challenge to auditing of graduates. On paper, changes in program and course demographics (course number, title, credit hour and sequence) may seem to cause little impact. However, implementing changes that can be tracked programmatically in a student information system (SIMS) requires an in-depth understanding of system architecture and curriculum, including progression of on and off-track students. Planning and implementation of the Banner Curriculum, Advising and Program Planning (CAPP) system required the development of a working group including Student Affairs/Academic Affairs and campus IT staff. From an evaluation of paper-based graduation audits of older curricula, methods were developed to ensure that future changes in curriculum can be easily added to CAPP. Results: CAPP allows the curriculum to be divided into core components, such as didactic and experiential, accounting for nuances of each. The implementation of CAPP, decreased the time needed to audit continuing and graduating students from an average of 40 hours to 5 hours. A system to incorporate registration staff and the school’s Curriculum Committee was essential to ensuring curriculum, course and program changes approved can be incorporated into the CAPP audit process. Implications: Student information systems are complex. Development of automated auditing systems decreases time to complete graduation audits by 87% and benefits from a multi-disciplinary team to ensure success.

Assessment of Student Performance and Perceptions of Learning in a Medication use Evaluation Project. Robert D. Beckett, Manchester University College of Pharmacy, Ozlem H. Ersin, Manchester University College of Pharmacy. Objectives: To describe and assess a medication use evaluation (MUE) team project in terms of student performance and perceptions of learning. Method: Following a 1-hour MUE lecture in a 62-student patient safety course, student teams were assigned a medication safety or quality issue. Teams worked with a mentor to design an MUE to address the topic. The primary deliverable was a recorded, webinar-style presentation. Presentations were assessed by two reviewers for content and presentation style using a rubric. Students rated level of agreement that they could perform MUE-related skills pre- and post-project on a 5-point Likert scale; results were compared using the Wilcoxon signed-rank test. Results: Mean presentation score was 45.0 +/- 2.7 of 50 points. Points were most commonly deducted from team scores (n=14) for poor or fair definition of endpoints (n=8), research question(s) (n=6), and resources needed to complete the project (n=5). Thirty-five and 34 students completed the pre- and post-project surveys, respectively (response rate 56% and 55%). Students perceived improved ability to design an MUE from pre- to post-project (median 3 vs. 4; p=0.003). Comfort determining inclusion and exclusion criteria (median 3 vs. 4; p=0.005), data to collect (median 3 vs. 4; p=0.003), interdisciplinary collaborators (median 3 vs. 4; p=0.001), study limitations (median 3 vs. 4; p=0.002), and potential uses (median 3 vs. 4; p=0.009) also improved from pre- to post-project. Implications: The project used active learning to enable student teams to achieve the objective of designing an MUE and related enabling outcomes as measured by evaluators and student perceptions.

Career Preparation... The Final Frontier: Maintaining Student Attention During Off Campus Experiences. Richard N. Dalby, University of Maryland, Shannon R. Tucker, University of Maryland, Lisa Lebovitz, University of Maryland. Objectives: The objective of this project was to design a process to maintain contact with 4th year students during their professional year and ensure they continue to meet their professional goals (for graduation, licensure and career development). Method: The final professional year in a PharmD student’s curriculum creates a communication gap that challenges an institution’s ability to stay in contact with the student and ensure they maintain focus on long term program goals be it graduation, licensure, certification or career planning for post-graduation. To encourage progress on educational and professional goals, UMSOP created a multi-faceted plan that included (1) the development of career preparation and study programs, (2) the promotion of online resources available to students off campus, (3) strategically timed reports of program progress and (4) a year-long communication plan leveraging the marketing tool Constant Contact to provide strategic reminders while students are off site. Results: The implementation an online marketing tool to mechanism to maintain contact with students has enabled UMSOP to strategically link programs and resources into one unified messaging platform providing (1) strategic reminders regarding graduation requirements, (2) career tips, (3) licensure guidelines, and (4) licensure study tips in one place. Implications: Maintaining student attention is challenging under ordinary circumstances. Development of a strategic communication plan does not guarantee the students who need the most mentoring will read messages or take advantage of services being promoted.

Development of an Academic Drug Information Center at a New College of Pharmacy. Robert D. Beckett, Manchester University College of Pharmacy, Whitney Jane A. Caudill, Manchester University College of Pharmacy, Doris F. Stephenson, Manchester University College of Pharmacy. Objectives: To describe and assess development
of an academic drug information center at a new college of pharmacy. **Method:** In January 2012 a new college of pharmacy launched a free drug information center. The Center is used by college faculty, staff, and healthcare professionals practicing at sites accepting the college’s students on experiential rotations. A drug information specialist, in collaboration with advanced pharmacy practice experience (APPE) students and pharmacy residents, coordinated and approved responses to requests. Descriptive information regarding requests (e.g., requester, affiliation, request type, time spent) was recorded. Following 6 and 24 months of operation, the 8 most recent requesters were invited to complete identical electronic quality assessment surveys. **Results:** The center responded to 71 and 109 requests in 2012 and 2013, respectively. Median time spent per request was 5 hours (IQR 1.5–9 hours). Requests mostly originated at primary care clinics (n = 65; 36%), hospitals (n = 53; 29%), and the college (n = 32; 18%). Seventy-six questions (42%) were regarding specific patients. Twelve responders (response rate 75%) completed the quality assessment survey. Ten (83%) agreed that the information received positively impacted their practice; the remainder indicated this question was not applicable. Most responders strongly agreed the information received was accurate (n = 12; 100%), complete (n = 12; 100%), concise (n = 11; 92%), clear (n = 11; 92%), helpful (n = 11; 92%), and up to date (n = 11; 92%). All responders indicated they would “definitely” use the center again. **Implications:** The center provides valuable service to responders; future efforts will focus on increasing use of the center by local healthcare professionals.

**How to Teach PubMed in 18 Minutes.** Xiaomei Gu, The University of Iowa. **Objectives:** To share strategies used to deliver a successful lecture on PubMed in 18 minutes. **Method:** PubMed has long been a module in the Pharmacy Practice Laboratory series at the author’s institution, utilizing lecture, discussion, and laboratory formats. Lectures and discussions are carried out in a large traditional classroom, which is not conducive to learning hands-on subjects like PubMed. In Fall 2013, the author shortened the hour-long lecture and discussion to an 18-minute session, covering only Search Details and Medical Subject Headings (MeSH). A compelling story was told at the beginning of the lecture to engage students, and a demonstration of filing articles with vertical file folders was performed to illustrate the concept of MeSH and its use in indexing articles. **Results:** In students’ post-lab reflections on what they had learned about PubMed, MeSH was the number one recurring theme. When tested individually on their PubMed skills at the end of the semester, 95% percent of the students successfully executed PubMed searches on assigned topics by using MeSH and/or Search Details. **Implications:** Many PubMed instructors face the dilemma of too little time and too much to cover. It is tempting to try to teach everything one knows about PubMed in a single class session. By re-thinking who the students really are and what is really important to them, the author shortened the lecture time and kept students focused on basics and essentials using techniques including story-telling and tangible demonstrations.

**Plagiarism Education Using a Flipped Classroom Approach.** Rienne Johnson, Northeast Ohio Medical University, Michelle R. Chyatte, Northeast Ohio Medical University, Heather A. McEwen, Northeast Ohio Medical University. **Objectives:** Students are afraid of plagiarizing. That is why a new approach to teaching proper citation and methods to avoid plagiarism were utilized simply by flipping the classroom for first-year NEOMED pharmacy students and the results are impressive. First-year pharmacy students take an interprofessional Evidence-based Medicine I course and become active learning participants in a flipped classroom session on plagiarism. **Method:** Inadequate citation practices are a leading cause of unintentional plagiarism. A YouTube video introduced the fundamentals of plagiarism, while a one hour class focused on strategies to avoid plagiarism, citing resources, and citing images. The goal of the session was to introduce plagiarism and citation components for further application in the curriculum. We examined the efficacy of the flipped classroom through descriptive statistics collected during a one-month period after the flipped classroom lecture. **Results:** Initial data indicates 58% of the 231 students viewed the YouTube video and the plagiarism slides were downloaded 292 times. The library guide was viewed 1,917 times. Exam results showed 95% of students correctly answered a question on summarizing information, while 36% correctly answered the common knowledge question. Review of posters in another course indicated 8 of 36 posters had no citation errors, while 14 of 36 posters combined two citation styles. **Implications:** Active participation can further student learning, especially for drier subject matter. Flipping the classroom for plagiarism did increase the application of the lesson in other courses. Results will be used for further curriculum development to optimize the flipped classroom approach for an interprofessional course.

**Student and Faculty Perceptions of the Use of Humor in the Pharmacy Classroom.** Robert D. Beckett, Manchester University College of Pharmacy, Lorin Sheppard, Manchester University College of Pharmacy, Audrey Rosene, Manchester University College of Pharmacy, Carmen Whitlock, Manchester University College of Pharmacy, Portia Dixon, Manchester University College of Pharmacy. **Objectives:** To describe and compare student and faculty perceptions of effects of humor and preferred types and frequency of humor in didactic pharmacy education. **Method:** Students and faculty at one college of pharmacy were invited to participate in a confidential survey. Questions, formatted as 5-point Likert scales where 1 = strongly disagree and 5 = strongly agree, were developed from studies assessing humor in other educational settings. **Results:** Eighty-nine of 132 students and 20 of 27 faculty (response rate 74% and 67%) completed the survey. Students agreed and faculty strongly agreed that there is a role for humor in the pharmacy classroom (median 4 and 5; p = 0.004). Students and faculty agreed that appropriate humor could make material more accessible; improve learning, interest, and attention; and make material more enjoyable (median 4 and 4 for all items). Students and faculty agreed that planned (median 4 and 4) and spontaneous (median 4 and 4) humor are acceptable. Students and faculty agreed that relevant (median 5 and 5) and self-deprecating (median 4 and 4) humor is appropriate and disagreed that humor that could be offensive (median 2 and 1.5; p = 0.01) or upgrading to others (median 2 and 1; p < 0.001) is appropriate. Students and faculty most commonly indicated one or two instances of humor per hour are optimal (49% and 50%) and typical (74% and 85%). **Implications:** Students and faculty perceive a role for humor in the pharmacy classroom and believe it could improve accessibility, learning, interest, attention, and enjoyment. One or two uses of relevant and/or self-deprecating humor are believed optimal.

**The EHR Crossroads: Selecting an Electronic Health Records System in an Interprofessional Environment.** Shannon R. Tucker, University of Maryland, Amy Ives, University of Maryland. **Objectives:** The objective of this project was to evaluate Electronic Health Record Systems (EHRs) for implementation in the school’s curriculum with focus on building opportunities for interprofessional education (IPE). **Method:** The 2013 CAPE outcomes encouraging the “utilization of technology to optimize medication use systems” assisted ongoing curricular assessment by identifying the need for additional student exposure to informatics and EHR systems. The
decision to implement an EHR within the school provided an opportunity for collaboration with other professional schools on campus. The inclusion of IPE in the UMB Strategic Plan has created an environment where collaborative opportunities are given serious consideration despite the complexities of multi-disciplinary implementations. A working group consisting of clinical faculty and technical staff was formed to identify requirements necessary to meet existing educational outcomes and to assess EHR systems in other health-profession schools. This group established that (1) order entry/verification, (2) medication administration records, (3) medical records (including lab values/progression notes), and (4) cost were primary factors to consider. Results: Eight EHRs were evaluated. Due to the immediate need for implementation, functional requirements and ease of implementation were given the greatest weight of all points of consideration during product evaluation and resulted in the selection of a medication oriented EHR. Implications: While the school of pharmacy decided to implement an EHR independently, the discussions with campus colleagues, including the campus Director of Interprofessional Education have identified a campus-wide EHR as a strategic area for improvement that will be addressed as a part of the strategic goal for IPE.

Updating the Core List of Journals for Libraries that Serve Schools and Colleges of Pharmacy. Robert D. Beckett, Manchester University College of Pharmacy, Sabrina W. Cole, Wingate University, Hannah K. Rogers, Mercer University, Skye Bickett, Philadelphia College of Osteopathic Medicine, Christina M. Seeger, University of the Incarnate Word, Jennifer A. McDaniel, Virginia Commonwealth University. Objectives: To produce a sustainable set of criteria to be used for journal inclusion in the Core List of Journals for Libraries that Serve Schools and Colleges of Pharmacy and to define a structured, objective process for future updates. Method: Librarians and drug information specialists searched the National Library of Medicine catalog by applying two to three medical subject headings (MeSH) major topics, as well as filters to indicate that titles are currently published in English and currently indexed in MEDLINE to generate an initial list of journals. Afterwards, inclusion criteria (i.e., having an impact factor greater than 5, focus on pharmacy or medication, being an official organization publication, and subscribed to by at least 50% of the workgroup’s institutions) were applied to narrow the list. The list underwent peer review from content experts. Results: The workgroup generated an initial list of 844 journals meeting identifying criteria. After applying inclusion criteria and voting, the fifth edition of the list was finalized with 214 journals and 11 pharmacy related periodicals which are organized into 6 main categories and 62 subcategories. Implications: The criteria and update process created by the workgroup produced a solid list of core journals and will be beneficial for future updates. The finalized list will be a valuable asset to pharmacy programs and provide a diverse selection of journals published in pharmacy, medicine, basic sciences, nursing, and allied health.

Theoretical Models:

Incorporating a Practical Final Examination into a Drug Information Course to Assess Skills Mastery. Sabrina W. Cole, Wingate University, Angela Pegram, Wingate University. Objectives: Describe the role of a practical final examination to evaluate students' drug information skills in a required drug information course. Method: The goal of the course delivered in the first-professional year is for students to develop a working knowledge of drug information resources, demonstrate information retrieval and searching skills, employ analysis and synthesis of information, and strengthen written and verbal communication skills. The systematic approach to delivering drug information is a core component of the course. Students are expected to demonstrate their ability to identify the informational need of a requestor (e.g., patient, physician), classify the request, select appropriate resources relevant to the request, analyze information found, synthesize a patient- and/or situation-specific response, and communicate effectively. A practical examination consisting of a realistic drug information request evaluates students’ ability to demonstrate the systematic approach. A rubric was developed to assess the following components of student responses: appropriate request classification; appropriate selection of resources; accurate interpretation of information; and correct citation format. Additionally, student responses must be written in their own words, utilizing complete sentences, internal reference formatting, and verification and validation in multiple resources. Results: Three outcomes are expected based on the practical examination as a final assessment: student selection of appropriate resources based on the specific request, extraction of correct information and development of a patient- and/or situation-specific response, and effective written communication and citation of the final response. Implications: A practical examination to evaluate drug information skills could enhance students’ integration of evidence-based medicine throughout their career.

PHARMACTUEICS

Completed Research:

A High-performance Liquid Chromatography (HPLC) Stability Indicating Assay for Estradiol and Related Substances. Sarah Baltzley, Abeer M. Al-Ghananeem, Sullivan University. Objectives: The aim of the present study was to develop a high performance liquid chromatography (HPLC) method for assay of estradiol (E2) and related compounds. Method: An HPLC method was developed and validated for the quantitation of estradiol and related substances in pharmaceutical dosage forms. The analytes were separated on a Waters Bondapak C18 column (3.9 mm x 30 cm x 10 m) with a mobile phase gradient elution program consisting of acetonitrile and water, at a flow rate of 1 mL/min and run time of 35 minutes. Detection was carried out using UV spectrophotometry detector at a wave length of 280 nm. The HPLC method was validated over the range of 500-1000 ng/mL. The stability-indicating capability of the method was established by analyzing samples placed in stressed stability conditions (45 oC/75% RH) per FDA guidelines. Results: The drug peak was well resolved from the peaks of the related substances. The retention times of Estradiol, Estrone (the main degradation product), and Dydrogesterone (internal standard) were found to be 8.5, 11.3, and 18.0, respectively. The method was found to be linear in the range of 500-1000 ng/mL with a correlation coefficient of 0.999. The range of Accuracy of concentrations was between 94.2% and 104.8 and RSD% between 0.16% to 2.34%. Implications: The HPLC method was successfully applied in analyzing and studying pharmaceutical dosage forms containing estradiol and related substances.

APPE Academic Elective in Compounding: Improving Learning and Teaching. Uyen Le, Sullivan University, Lindsay Timmons, Sullivan University, Sarah Barrigar, Sullivan University, Kacy Nguyen, Sullivan University, Jessica McGohon, Sullivan University, Jennifer Hale, Sullivan University, Manuel Francia, Sullivan University, Wasana K. Sunanasekera, Sullivan University, Maria Lourdes Ceballos-Corinel, Sullivan University, Gopalakrishna Pillai, Sullivan University. Objectives: The purpose of this study is two-fold. First, we evaluate the benefits that APPE students acquired from their academic elective rotations in compounding. Second, we assess the courses’
improvement with the support of the APPE students. **Method:** Two six-week APPE rotations were designed and implemented in a three-credit course of Pharmaceutics with compounding lab. APPE students were involved in all teaching activities. Evaluation of the benefits from these rotations was accomplished through surveys sent to the class students (CS) and APPE students (AS). Additionally, a comparison of course evaluation and student grading from the previous year is also integrated into the evaluation. **Results:** Four out of 4 AS and 87 out of 94 CS participated in the surveys. The rotations helped the AS improve their calculations; solidify learned compounding concepts, and enhance their compounding and presentation skills. More importantly, they gained significant experiences in teaching, problem solving, and communication skills. More than 90% of the CS answered that AS were competent, well-trained, and essential to facilitate the work flow in lab. Approximately 80% of the CS stated that AS were helpful in calculations or could independently conduct the lab. Finally, the course organization and student grading from the current year were ranked 86.3% and 91.5±4.6%, respectively, which were 50.6% and 5%, respectively, improved as compared to those from the previous one. **Implications:** Both AS and CS found the rotations beneficial. The study facilitated designing an appropriate APPE academic rotation in compounding to achieve its optimal benefits.

**APPE Research Elective on the Preparation of Liposomal Drug Delivery Systems.** Uyen Le, **Sullivan University. Objectives:** Liposome drug products have been accepted by the FDA for fungus, cancer, and vaccines. However, understanding of this advanced delivery systems is still limited as compared to conventional pharmaceutical formulations. The major goal of these APPE research elective rotations was to allow students to approach to the bench work of liposomal preparation. From that experience, students could have concept clarification of liposome properties, usage, and storage condition. **Method:** Five- to six-week APPE rotations were designed as team-based practice and offered four to five times a year. At the beginning of each rotation, students were provided with liposome background and appropriate laboratory training. Then they were assigned to specific projects of liposomal delivery systems. Each rotation included liposome preparation, purification, quantification, and specific application. Students were assessed in terms of project implementation, data analyzing, report, and/or presentation. **Results:** Fourteen rotations were offered to 23 APPE students in the past three academic years. All students were highly graded (>90%) by the preceptor on the liposomal technology. They showed high interest in the lab work and competency in drug information regarding liposomes. Among the assigned projects, two were presented as posters at peer-reviewed conferences; in which one was for gabapentin transdermal delivery and the other was about the delivery of gemcitabine and curcumin for cancer treatment. **Implications:** These APPE rotations provided a great opportunity for pharmacy students to approach to the drug development of liposomal delivery systems. More importantly, they improved students’ research skills, such as the patience, research design, data analysis, problem-solving and presentation skills.

**An Overview of the Integrated Pharmaceutical Sciences Core Laboratory at a Doctor of Pharmacy Program.** Aladin A. Siddig, **University of Charleston, Ronaldo Ramirez, University of Charleston, Michelle L. Herdman, University of Charleston, David A. Latif, University of Charleston, Lindsay Acree, University of Charleston. Objectives:** This innovative laboratory expose students to the use of basic laboratory equipment, using principles of Pharmaceutics in the identification of certain pharmaceuticals, and the understanding of the principles and procedures of clinical testing. **Method:** Integrated Pharmaceutical Sciences Core Laboratory is a one-credit hour core course that is open to first year PharmD students. The lab is structured into three main major sections. An initial basic laboratory section introduces the student to key foundational concepts of safety, weights and measures, pharmaceutical preparations, and dissociation and neutralization of acids. The second section includes testing of large and small volumes parenteral, with focus on preparations, applications and use of isotonic solutions. A final section concludes with two parts of clinical testing. The first part is Immunological Laboratory Tests, which includes Streptococcus A, Rheumatoid Factor, Pregnancy, Home Drug Testing Kits, ABO typing. The second clinical component includes: ELISA-HIV, Monoclonal Antibody Production, and Fluorescent Antibody Cell Sorting. **Results:** Laboratory assessment results, student evaluations, and anecdotal verbal feedback from students in the fall 2009-2013 guided refinements to this core laboratory each year. The mean lab evaluation in all five years was above 80%. The qualitative comments were invaluable tools in course refinement over the years. **Implications:** This laboratory provides first year students with knowledge and practice of both basic science and clinical applications. This foundational course helps to prepares students for both the basic science and therapeutic parts of the curriculum.

**Analysis of the Effects of Changes to Anteroom Cleaning Procedures.** Justin R. Cornwell, **Manchester University College of Pharmacy, Kimberly A. Perkins, Mary E. Kiersma, Manchester University College of Pharmacy. Objectives:** Microorganism growth in IV rooms is common even with proper cleaning and documentation. Methods to reduce the bioburden are staff education and implementation of new cleaning procedures. In order to establish new cleaning procedures and policies practices must be evaluated and samples must be taken. Per USP <797> an ISO class 7 area is allowed to have 10 CFU/m3. The objective is to evaluate the effect of new cleaning procedures on bacterial growth in the IV room. **Method:** Data was obtained in November 2013 showed significant bacterial growth in the anteroom. Ten samples were taken weekly for one month. Areas tested included: door handles, sink, faucets, bins, wire racks for storage, vials from the pharmacy, and the floor. Changes to cleaning procedures included: Using a wire rack over a metal cart proved to produce less growth in an IV anteroom, mopping the entire floor, cleaning the sink, cleaning the wire rack, and washing the sink multiple times per day. When bringing products into the IV room to be compounded; transfer to a clean bin after properly wiping them down with 70% isopropyl alcohol. The samples were sent to the hospital laboratory for analysis. **Results:** In November 2013, the anteroom had greater than 10 CFU/m3. After cleaning procedures and practices were modified, the colony counts obtained ranged from 0-5 colonies isolated which met the USP 797 requirements. **Implications:** Implementing cleaning room procedures decreased the bacterial growth in the IV room. Other IV rooms could implement these changes to be USP 797 compliant.

**Awakening the Pharmacist in You(th): The Design and Evaluation of a Pharmacy Career Awareness Program.** Christine R. Birnie, St. John Fisher College, Lipika Chablani, St. John Fisher College, Vivek S. Dave, St. John Fisher College, Parag Budukh, David J. McCaffrey, St. John Fisher College, Scott A. Swigart, St. John Fisher College. **Objectives:** The Exploring Pharmacy as a Career awareness program was developed to provide a means to expose high school students to pharmacy careers and opportunities. The purpose of this study was to evaluate this program and its impact on participants. **Method:** A six-week long evening program was developed for high school students to raise awareness and provide opportunities to learn about the pharmacy profession. Three sessions were reserved for pharmacy career
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information, pharmacy school admission requirements and related pharmacy topics. The remaining three sessions were devoted to active learning opportunities; participants visited both community and institutional pharmacies and completed hands-on activities in the compounding laboratory of the School of Pharmacy. At the completion of the program, a thirteen-question anonymous survey instrument including Likert-type (1 = Low, 5 = High) and open-ended questions was administered to the participants for the purpose of program evaluation and improvement. Results: Of the 25 participants, 17 (68%) completed the survey. Participants responded positively in all question areas, with mean scores ranging from 3.47 – 4.94. Compiled data from respondents indicated their interest in the pharmacy profession increased throughout the program, increasing from 4.06 before the program to 4.41 after completion. Responses to Likert-type and open-ended questions revealed that the compounding laboratory exercises and visits to the hospital pharmacy were the program highlights. Implications: In addition to efforts to recruit qualified college students, Schools/Colleges of Pharmacy, using programs such as the Exploring Pharmacy as a Career, can stimulate primary demand for pharmacy education as well as provide a valued service to the local community.

Contemporary Pharmacy Compounding Education: Independent Community Pharmacists’ Perspectives. Geneva Chen, West Coast University, Craig Hitchman, West Coast University, Shih-Ying (Audrey) Hsu, West Coast University. Objectives: To understand current compounding practices among independent community pharmacies located in a large metropolitan area and to solicit those pharmacists’ opinions on advanced compounding issues that should be addressed in the PharmD curriculum. Method: The study surveyed eligible pharmacies located within 50-mile radius of WCU SOP in Los Angeles CA. Lists of pharmacies were obtained from the California State Board of Pharmacy. Telephone interviews were conducted with pharmacist in charge/pharmacy managers; they completed a questionnaire with 10 multiple-choice questions. Those who were unable to complete the phone interview were offered an option to receive the questionnaire via e-mail or fax. This study was approved by the WCU Institutional Review Board. Results: Of 149 pharmacies included in this study, 81 completed the questionnaire (response rate: 54.3%). Thirty-six respondents (44.4%) practiced compounding while only five (6.2%) practiced sterile compounding. The top three compounding areas were dermatology (86.1%), pain management (80.6%), and bio-identical hormone replacement therapy (75%). Majority of the compounding pharmacists (91.7%) indicated that the PharmD curriculum should include an advanced compounding course. Legal issues (77.8%), management (63.9%), and marketing (72.2%) were considered as important topics for the course. Implications: New federal and state compounding laws will impact the current compounding practices on many levels. This study is part of an ongoing effort to understand this phenomenon and to better enable schools of pharmacy to prepare their graduates to navigate these complex changes. Opportunities may exist for schools of pharmacy to provide continuing education programs to practitioners as a means to promote compounding services.

Design and Evaluation of Multilayer and Core Sustained Release Tablets. David Curry, Sullivan University, Sherry Rosas, Sullivan University, Michaela Richardson, Sullivan University, Sarah Baltzley, Aber M. Al-Ghananeem, Sullivan University. Objectives: To develop and evaluate the effect of sustained release formulation components and tablet design on drug in vitro release profile. Method: Tablets were made with different designs- matrix and core, as well as a sophisticated layer tablet with immediate release outer layers and sustained release inner layer using dantrolene sodium as a drug model. The in vitro release of the drug from different polymers such as Methocel K4M, Sodium alginate, and Pluronic F-127 were performed using USP recommended parameters in alkaline and acidic media. Analysis was done using UV spectrophotometer at 300 nm. Results: Methocel in a matrix tablet demonstrated the highest total drug release at a pH 6.8 with an initial peak of 23.5% at 1 hour. Drug release levels were dropping to 11.5% after 6 hours as compared to Sodium alginate polymer, which released the drug at about 11.4% rate from 3-7 hours, and Pluronic, which had a peak drug release at 8.4%. The acidic media demonstrated lower drug release overall. As the percentage of polymer was decreased in the tablets from 40% to 5%, maximum drug release increased from 2.5% to 19.6%. Matrix type tablets exhibited an early peak by 1 hour, but could not sustain release effectively. In contrast, Core tablets showed a slower, more gradually increase drug release rate and dissolution rate. Implications: Polymer type and tablet design are important factors to consider during dosage form development of sustained release tablets.

Determination of Physicochemical Properties of Novel Anticonvulsant Compounds Using Simultaneous Thermal Analyzer. Rajesh Vadlapatla, University of Saint Joseph, Anika Rehman, University of Saint Joseph, Ivan O. Edafiogho, University of Saint Joseph. Objectives: The objective of this project is to study physicochemical properties of different analogues of enaminones. Enaminones are a novel class of compounds that have shown to possess anticonvulsant properties. Method: Simultaneous thermal analyzer (STA) was used to determine physicochemical properties such as melting point, purity, crystallinity, degradation and drug-excipient compatibility studies. Thermal profiles of individual enaminone compound and each selected excipient were compared with their binary and ternary mixtures of equal proportions of drug and excipients for their compatibility studies. The standard excipients used in this experiment include: corn starch, hydroxypropyl methyl cellulose, and lactose monohydrate. Results: Physicochemical properties of eleven analogues of enaminones were determined. The temperature range for decomposition for majority of enaminones is between 300-450OC. On the basis of thermal results, a possible interaction was found between the model compound enaminone E122B and the excipient lactose, which could influence the stability of the E122B in the binary and ternary mixtures. There was no interaction found between E122B and the excipients corn starch and hydroxypropyl methyl cellulose. Implications: The simultaneous thermal analyzer is a fast and efficient way to determine the physicochemical properties of different analogues of enaminones. STA has been shown to be an important and highly sensitive tool to quickly obtain information about thermal properties and compatibility studies.

Developing Human Papillomavirus (HPV) Vaccine for Cervical Cancer. Mohammad N. Uddin, Wingate University. Objectives: Cervical is the second most cancer among women all over the world. Two HPV type-specific prophylactic vaccines are used in several countries world-wide. But these vaccines are expensive, require cold chain storage and trained personnel to administer injections. The goal of this project is to develop a particle based HPV vaccine formulation for oral administration that will be cost effective and can be used in resource poor countries. Method: The particulate vaccine containing VLPs was prepared in a simple one step spray drying process using a biodegradable polymer. The size, shape and surface morphology of the particles was determined by scanning electron microscopy (SEM) and the surface charge was determined by the Malvern Zetasizer. Within the particle, the presence of VLP was determined using SDS-PAGE analysis and quantified using Western blot. VLP conformation was ascertained
Development and Validation of Reverse-phase High Performance Liquid Chromatographic (HPLC) Method for Ondansetron Analysis. Quanrun N. Masuda, Appalachian College of Pharmacy, Mamoon Rashid, Appalachian College of Pharmacy, Randy Mullins, Appalachian College of Pharmacy. Objectives: To develop and validate a robust and reproducible HPLC method which will be used for assay of ondansetron in in-vitro research samples and/or in various formulation matrices. Method: A reverse-phase HPLC method was developed using Waters 2695 Alliance separation module coupled with 2996 Photo Diode Array (PDA) detector and a C-18 Symmetry column for the assay of ondansetron. Mobile phase was composed of acetonitrile and 0.02 M phosphate buffer in the ratio of 45:55. Prior to mixing acetonitrile, the buffer was modified with 0.1% triethanolamine. The analysis was performed at room temperature. Ondansetron was detected at 254 nm wavelength. Sharp and symmetrical ondansetron peak was eluted at 2.6 minute of retention time. The method was validated for accuracy, precision, reliability, and robustness. The validated method was used to analyze spiked samples as well as marketed samples in formulation matrices. Ondansetron from formulation matrices were extracted with methanol. The sample was diluted with double distilled water. Results: Calibration curve was constructed using working reference standard of ondansetron within concentration range 5 mcg/mL to 50 mcg/mL inclusive. The standard curve was linear with R2 = 0.999. This robust method was used to assay ondansetron in conventional compressed tablet as well as orally disintegrating tablets. The recovery was within 5% of label claim. Implications: This analytical method can be used to assay ondansetron in any formulation matrix.

Evaluation of a Professional Development Strategy Implemented within a Chapter of a National Student Organization. Bill J. Bowman, Midwestern University/Glendale, Erin C. Raney, Midwestern University/Glendale. Objectives: To implement a series of professional development activities for the leaders within an APhA-ASP Chapter, assess the Emotional Intelligence (EI) of these leaders, and determine the leader’s perceptions regarding their professional development. Method: During the 2012/13 term, a series of four group workshops and four individual reflection sessions regarding organizational management, EI, leadership strengths, teamwork, and continuous professional development was implemented by the chapter co-advisors for their student leaders (n = 9). In addition, each student leader was asked to complete the Emotional Intelligence Appraisal® test (EIAT) at the beginning and end of their term, and an anonymous online survey regarding their professional development immediately following their term. Results: Both the EIAT and online survey had an overall response rate of 100%. The mean overall EI scores at the beginning and end of the term were 75 +/− 9 and 79 +/− 8, respectively. All student leaders either agreed (n = 1) or strongly agreed (n = 8) that serving as an APhA-ASP officer facilitated their professional development. Of the leaders that participated within a particular experience (n = 3−9), most rated the experience as being either beneficial or very upon dosing, rapid sublimation of matrix, thereby exposing entrapped drug. Exposure of released drug particles to gastrointestinal fluids allowed dissolution to occur at a rate not significantly different from the rate at which a simple (uncapsulated) suspension of drug would dissolve in the gastrointestinal tract. Implications: This delivery technology could provide an optimal balance between drug insolubility in aqueous suspension to avoid bitter taste and simultaneously achieve rapid drug dissolution after ingestion into the gastrointestinal tract.
beneficial to their professional development (83-100%). The individual reflection sessions were the experiences most frequently indicated as being most beneficial (n=8). Incorporating more teambuilding activities was the most frequent recommendation for improvement (n=3). Implications: A series of professional development activities was successfully implemented. The EI of the student leaders appears to have increased over their term and the leaders perceived that their experiences as APHA-ASP officers enhanced their professional development.

Evaluation of a Team-Based Activity for Learner Centered Acquisition of Information from Drug Package Inserts. Deepa Rao, Pacific University Oregon, Jeff Fortner, Pacific University Oregon, Ashim Malhotra, Pacific University Oregon. Objectives: The overall goal of the activity was to improve student team-directed learning to facilitate the dissemination of information to peers. Specific objectives of the activity were to identify, navigate, assess, and communicate product package information. Method: Fourteen teams of 7 students each were assigned a drug pertaining to a route of administration. To improve drug information retrieval skills each team was tasked to locate a current product package insert (PPI) and cite three resources utilized to obtain the insert. Based on the PPI teams created a poster to communicate the available dosage forms and routes of administration, identify drug physical and chemical properties, excipients, mechanism of action, adverse effects, and deduce counseling points. Each team presented their poster to their peers. Each student was required to assess 12 of the 14 teams for clarity, presentation skills, and communication of information. Students could also complete a voluntary online survey assessing the objectives of the activity. Each of the teams was also assessed by four faculty for clarity, accuracy, and presentation and knowledge-based skills. Results: Student and faculty evaluation of teams ranged from 72.7–86.7% and 76.3–92.5% respectively based on a 4 point Likert scale. The online survey results indicated that the students developed collaborative and communication skills, and 2/3 of the students surveyed believed that the activity should be repeated in the future. Implications: These results indicate that the overall activity was effective in identifying, navigating, assessing, and communicating product package information in a collaborative team-directed learning paradigm.

Evaluation of Dietary Softgel Capsules using USP <701> and USP <2040>: A Comparative Disintegration Study. Matthew Yacobucci, St. John Fisher College, Chintan Shah, Bausch and Lomb, Ted Huang, Bausch and Lomb, Daniel Stein, Bausch and Lomb, Fang Zhao, St. John Fisher College, Lipika Chablanl, St. John Fisher College. Objectives: USP implemented a new rupture disintegration test (USP <2040>) for dietary supplements in 2007. This study evaluates a vitamin product using the conventional USP <701> and the new USP <2040> rupture test. Method: The softgel capsules were subjected to accelerated stability conditions (40°C/75% RH) for two and four weeks. The samples were evaluated for disintegration and rupture test according to USP <701> and USP <2040> respectively (n=6 each). Gelatin dissolution was also monitored for these samples during the rupture test (n=6 each—extended to 60 min). For gelatin release, the disintegration medium was sampled at 5, 15, 30, 45 and 60 minutes and analyzed at 220 nm by UV-visible spectrophotometer. Results: All samples (initial, two and four week) passed the USP <701> disintegration test. However, only time zero softgel capsules passed the USP <2040> rupture test. Complete gelatin dissolution was observed at 60 minutes; 98.96 ± 2.14%, 95.71 ± 3.14% and 103.53 ± 5.64% for initial, two and four week stability samples, respectively. Statistical analysis (ANOVA) of the gelatin release data showed no significant difference between the 60-minute samples (p > 0.05). Implications: The gelatin dissolution profile confirms no dissolution differences between fresh and aged product. There are differences in performance between USP <2040> and USP <701>. These methods are not equivalent. It is recommended to utilize USP <701> until data is generated to understand if test failures are indicative of non-performing product. Since gelatin dissolution is at the same rate, it is likely the contents would be available for absorption and test method <701> is suitable.

First Semester Academic Success is a Predictor of Academic Honor Society Acceptance. Donald A. Godwin, The University of New Mexico, Keenan L. Ryan, The University of New Mexico, James J. Nawarskas, The University of New Mexico. Objectives: To evaluate the probability of eligibility for membership in Rho Chi (Top 20% of class) after the third, fourth, or fifth semesters based on class rank after the first academic semester. Method: First semester pharmacy grades were used to calculate initial class rank for six cohorts of entering students (2005 – 2010) and changes in class rank were tracked over four subsequent semesters. Additionally, the probability of the initial top 20% ranked students ranking in the top 20% after third through fifth semesters (qualifying for Rho Chi induction) was calculated. Results: Average entering class size was 84.3 ± 4.3 students per year with an average Rho Chi cohort of 17.3 ± 1.2 students admitted following the fifth semester of pharmacy school. The probability of a student ranked in the top 20% after the first semester being offered Rho Chi membership was approximately 85% (range 84.5 ± 8.2% to 85.3 ± 7.6%), with no significant differences between the third through fifth semesters. Implications: Academic success in the first semester is a strong predictor of academic success in subsequent semesters and high achievement (top 20%) in the first semester is a predictor of continued high achievement. No significant differences exist when offering membership in Rho Chi after the mid-point of the second year or waiting until the mid-point of the third year. Rho Chi chapters should offer membership as soon as by-laws allow. In addition, high performing students in the first semester should be identified and cultivated for membership.

Granular Analysis of a Course-Level Curriculum Map for an Introductory Pharmacy Course – A Pilot Study. Vivek S. Dave, St. John Fisher College, Lipika Chablanl, St. John Fisher College, Jane M. Souza, St. John Fisher College, Anand Sridhar, St. John Fisher College. Objectives: To retrospectively analyze a course level map for a first year pharmacy course at a granular level to assess student learning against course learning outcomes. Method: The Assessment Committee developed a Course-Level Map template to align course learning outcomes, ACPE standards, program learning outcomes, teaching activities, assessment activities, student performance, and actions taken based on performance. ‘Principles of Pharmaceutical Sciences’ was chosen as a pilot for the effective use of the template. 187 test items were used to assess student learning. Each question from all the exams was electronically coded to learning outcomes. Assessment results for each item were mapped to corresponding course learning outcomes. Underperforming items (< 80% class average) from each learning outcomes were highlighted and reviewed. Depending on the identified cause of underperformance, appropriate action steps were noted. Results: The coverage for each learning outcome was found to be optimal i.e. the questions were uniformly distributed across the learning outcomes. The underperforming items ranged from 0 to 37% for each learning outcome. Overall, ~20% of items were found to have underperformed. The main cause of underperformance was found to be the structuring of the questions, requiring rewording. Other
causes included difficulty in students’ understanding of concepts due to either insufficient emphasis or time-spent on the topic. **Implications:** The detailed analysis of the course map provided a deeper understanding of student-learning of the course as well as clear action-steps to be taken to improve student performance in future. The need for peer-review of test items was indicated.

**Hedgehog and Tyrosine Kinase Inhibitors for Treating Breast Cancer.** Michael Danquah, Chicago State University, Elvis Boamah, Qadus Ibrahim, Chicago State University, Lordcarse Kwinji, Chicago State University. **Objectives:** To determine whether combination therapy targeting sonic hedgehog (HH) and epidermal growth factor receptor (EGFR) pathways can inhibit breast cancer growth. **Method:** Cell viability was determined by MTT assay. Gli-1 expression was determined by real time RT-PCR. **Results:** MDA-MB-231 breast cancer cells were treated with cyclopamine (HH inhibitor) and two tyrosine kinase inhibitors: gefitinib and axitinib at concentrations ranging from 0 to 100 µM for 72 h. Gefitinib was more potent than axitinib in inhibiting MDA-MB-231 cell proliferation. IC50 for gefitinib was ~7.9 µM compared to ~35.56 µM for axitinib. Also, IC50 for cyclopamine was ~3.5 µM. Cells were then treated with cyclopamine (10 µM) and gefitinib (10 µM) alone or in combination for 72 h. Combination therapy resulted in a supra-additive effect and decreased cell proliferation by ~60%. In contrast, monotherapy decreased cell proliferation by ~10%. Additionally, combination of cyclopamine and gefitinib more effectively downregulated Gli-1 expression in MDA-MB-231 breast cancer cells compared to monotherapy. Gli-1 expression decreased by ~80% for combination therapy compared to ~20% and ~60% for gefitinib and cyclopamine, respectively. Finally, cyclopamine and gefitinib were formulated into micelles using PEG-P(CB-co-LA) copolymer to enhance solubility. Micellar solubility of cyclopamine and gefitinib were performed using murine connective tissue (L929), human tongue (SCC-4) and pharyngeal (FaDu) squamous cell carcinoma models, respectively. **Results:** Several prototype NEs were formulated using oil phase of chia seed oil, containing 30 wt% α-tocopherol. Gen, was mixed with addition of 5 wt% surfactant blend (2:3:3-2 of TPGS:Solutol HS/Tween 80). Coarse emulsions formed after adding 2% chitosan solution, were untra-sonicated/extruded. Finally, lyophilized NEs, were compressed as lozenges. Assessment of mucoadhesive strength and residence time were assessed, for screened Gen-NEs, and buccal tablets. Assays of in vitro biocompatibility and cytotoxicity were performed using murine connective tissue (L929), human tongue (SCC-4) and pharyngeal (FaDu) squamous cell carcinoma models, respectively. **Results:** Mucoadhesive NE sprays and buccal tablets showed high Gen-loading, stable cationic ζ-potential and size (~120nm), plus sustained release profile (up to 96 hrs). Chitosan-layered formulations showed marked mucoadhesive properties, Ex Vivo (Buccal tablet > solution). Chitosan-coated NEs demonstrated superior cytotoxicity in both oral carcinoma models (IC50 values for muco-adhesive formulations were 5-6 folds < those of simple anionic NE controls) **Implications:** Our layered nanoemulsion-based oral tablets/sprays may be applied as a mucoadhesive platform for maintenance/preventive therapy after oral cancerous lesion resection. This strategy aims to eliminate residual cancerous cells remaining after tumor removal, thus can minimize the risk of post-operative metastasis, due to remnant/detached cancerous cells.

**Promoting Awareness of Medication Errors to Facilitate Student Learning in Pharmaceutical Sciences.** Reza Karimi, Pacific University Oregon, Kristen Malabanan, Pacific University Oregon, Jeff Fortner, Pacific University Oregon, Aleksandar Todorovic, Pacific University Oregon, Deepa Rao, Pacific University Oregon. **Objectives:** To promote first year (P1) students’ awareness of the negative impact that medication errors have on patient populations and the healthcare community at large and discussing these errors to support student learning in pharmaceutical sciences. **Method:** An integrated curricular activity was designed and 14 student groups were built to work on 14 different authentic medication errors. Each group was asked to use the lessons learned from medication errors and generate a professional report and presentation that integrated pharmaceutical sciences. A survey instrument was generated and implemented to assess the effectiveness of the integrated curricular activity and 69 students (71%) completed the survey. **Results:** The quantitative assessment data indicated that 98% of students agreed the integrated curricular activity enhanced the awareness of devastating effects that a medication error could...
cause to patients, 94% agreed that it promoted patient safety discussions to establish a plan to prevent a medication error, and 99% agreed that after working with their project, they believed patient education played an important role in the prevention of a medication error. In addition, 85-90% of students agreed that the curricular activity increased their team work dynamics, integrated the knowledge and skills they developed through P1 curriculum, promoted active learning and critical thinking, and encouraged students to be self-directed learners. The qualitative assessment data indicated students appreciated learning about different types of medication errors and techniques to promote patient safety. **Implications:** The integrated curricular activity encourages discussions of patient safety and medication errors and promotes student learning in pharmaceutical sciences.

**Pursuit of Excellence in Pharmaceutical Compounding Course.** Quamrun N. Masuda, Appalachian College of Pharmacy, Randy Mullen, Appalachian College of Pharmacy, Mamoon Rashid, Appalachian College of Pharmacy. **Objectives:** Promote student-centered learning to improve competence in providing pharmaceutical care service, quality and regulatory concept driven compounding, and demonstrating professionalism. **Method:** This work demonstrates competence-assessment driven course quality improvement in ‘Pharmaceutical Compounding’ at Appalachian College of Pharmacy (ACP). This course builds scientific knowledge in areas of pharmaceutical calculations, top 200 drugs, art of compounding, dispensing regulations, communication skills, and usage of drug information resources. Assessment is conducted longitudinally throughout the course. Most activities are faculty facilitated student-centered learning, encompassing self-paced and time bound assignments. The competencies were assessed in several ways, including observation, manual grading, and final exam. All assessment methods used are preexisting validated approaches. Minimum competence was 70%, while excellent competence was at 90% of the assignment specific point. The assessment process was based on the fundamental question, ‘Do the students meet the course objectives in terms of knowledge, skill, and attitudes at the designated learning level?’ **Results:** Data from previous four year reflect excellent competence, irrespective of pedagogy or assessment technique, with the exception of end of course proctored examination. Historically 1 or 2 students in the class fail in the examination and fail to demonstrate scholastic competence, although the skills and attitude assessment compensate the deficiency. **Implications:** The pedagogy and assessment tools used in this course is fairly consistent and revealed reproducible measure of students’ progress toward desired outcomes and competencies. These tools measure general and specific knowledge and comprehension as well as critical thinking and problem-solving skills.

**Stabilization of HIV-1 Microbicides in Hydrophobic Subliming Solid Matrix.** Simi Gunaseelan, West Coast University, Philippe Gallay, Charlene Dazzuti, Richard Maskiewicz, Loma Linda University. **Objectives:** In the absence of an effective vaccine, topical microbicide formulations represent an attractive solution to stop vaginal HIV transmission. However, these microbicides (e.g., peptides, antiretroviral drugs) must be stabilized against degradation during its delivery within the continuously warm and moist genital environment. Unlike essentially all other sustained release delivery systems, subliming solid matrices can stabilize antiviral agents due to their hydrophobicity and chemical inertness. **Method:** The subliming matrix, perfluorounodecan (PF-11), was employed to demonstrate the ability to stabilize HIV-1 microbicides C5A and emtricitabine. C5A is a hydrophobic, low solubility, chemically reactive eighteen amino acid peptide [MW = 2,537] whereas emtricitabine is an uncharged but highly water soluble molecule [MW = 247]. These microbicides were tested within PF-11 matrix and in their free forms for their in vitro stability under simulated vaginal conditions. **Results:** Subliming matrices stabilize incorporated drugs by being continuously hydrophobic since drug release is due to a surface erosion process. Preliminary results indicate that powders of C5A and emtricitabine stored as dispersions within PF-11 immersed within water at 37 °C are significantly more stable than free powders of solid microbicides stored at 100% relative humidity at 37 °C. The hydrophobic, non-porous, and chemical inert nature of sublimable matrix interiors was further demonstrated by the complete un-reactivity of matrix incorporated C5A and emtricitabine in continuous contact with vaginal fluid simulant. **Implications:** The stabilization of microbicide within a subliming matrix can enhance its endurance and maintain its antiviral potency within the genital environment suggesting novel delivery capabilities.

**Student-led design and Implementation of a Compounding Module within a Pharmacy Practice Course.** Christine Kim, Touro College of Pharmacy New York, Philip Villasurda, Touro College of Pharmacy New York, Craig A. Kovera, Touro College of Pharmacy New York, Thomas J. Cook, Touro College of Pharmacy New York, Nima Akhavein, Touro College of Pharmacy New York. **Objectives:** Expanding research is supporting the value of peer teaching and mentoring across many disciplines, particularly in medical education. This study describes the design and implementation of a pharmacy compounding module led by third-year (P3) PharmD candidates at Touro College of Pharmacy (TCOP). **Method:** In the Fall of 2013, the P3 student-teachers, under faculty supervision, led the compounding section of a pharmacy practice course for second year (P2) students. Student-teachers developed and implemented lab activities, assessments, and lectures and held tutoring sessions for P2 students enrolled in the course. At the end of the semester, P2 students completed a survey focusing on the impact of the P3 student-teachers within the course. **Results:** Surveys were completed by 94 students enrolled in the course (92% response rate). P2 students responded favorably to the role of P3 students in the course with favorability ratings greater than 65% in several categories (e.g., confidence in skills, teaching effectiveness, etc). P2 students (91%) preferred the presence of student-teachers compared to other classes. **Implications:** This study describes the successful implementation of a student-led compounding module. Student teachers provided a unique perspective in the pharmacy lab, helped improve confidence in compounding skills and calculations and cultivated an overall positive educational experience that was beneficial and encouraged by the P2 students. The role of student teachers, its implied benefits and value in pharmacy lab courses should be further explored.

**Students’ Perceptions Regarding the Incorporation of a Pharmacy Compounding Station within a Professional Skills OSCE.** Bill J. Bowman, Midwestern University / Glendale, Melanie A. Jordan, Midwestern University / Glendale, Melissa Rudinsky, Midwestern University / Glendale, Stephanie J. Counts, Midwestern University / Glendale. **Objectives:** To determine students’ perceptions regarding the incorporation of a pharmacy compounding station within a professional skills OSCE. **Method:** Professional Skills Development 4 (PSD 4) is a required course taken by our students during the fourth quarter of their first didactic year. This course culminates with a capstone OSCE just prior to the students’ IPPEs. During the 2010-2013 academic years (n=3), a compounding station was incorporated within the OSCE. The station required students to prepare a suspension product from manufactured tablets based upon a mock prescription and a corresponding formula within the Drug Information Handbook. A survey instrument
was also distributed and collected at the conclusion of the station. The instrument asked students to indicate their level of agreement with 16 statements regarding various aspects of the station using a four-point scale. **Results:** The overall response rate for the survey was 98% (n = 435). A majority of respondents (78-99%) either agreed or strongly agreed with each of the 16 statements regarding various aspects of the station. However, 12% and 18% either disagreed or strongly disagreed with the statements “assessments similar to this should be included within the second didactic year of our curriculum” and “workshops that are similar to this assessment should be included within PSD 4 prior to the OSCE”, respectively. **Implications:** Based upon student perceptions, a compounding station was successfully incorporated within a professional skills OSCE. However, a notable percentage of the students appear to believe that similar activities should not be included within other areas of the curriculum.

**Teaching Drug Development and Regulatory Science using a Board Game.** Yuzhu Teng, Albany College of Pharmacy and Health Sciences, Maree C. Michaud-Sacks, Albany College of Pharmacy and Health Sciences, Jing Liu, Gail Goodman-Snittkoff, Albany College of Pharmacy and Health Sciences, HaiAn Zheng, Albany College of Pharmacy and Health Sciences. **Objectives:** The drug development process is a central paradigm for the pharmaceutical industry. For the past five years, a board game, PharmaDa$h, has been used in Pharmaceutics as a tool to promote understanding of the risks involved in the process. In 2013, the game was refined based on previous feedback. Improvements included shortening completion time and increasing ease of play. The objectives of this study were to assess the effect on achievement and to determine perceptions of the new version. **Method:** The game is utilized in Interdisciplinary Problem Solving (IPS) Workshop by establishing teams of 3-4 students. Mimicking the stages of drug development, participants advance through gaining (or losing) “money” by answering questions to review material. A team can win by completing all steps or obtaining the most “money”. A quiz was conducted and analyzed using a t-test, to uncover differences in achievement between students who have (have not) played Pharmada$h. A survey collected perceptions of the game. Focus groups were conducted with students and workshop leaders to gather feedback on the revision. **Results:** A quiz covering Pharmada$h concepts was conducted after half of the students had played in IPS. Students who played the game performed better on the quiz (p = 0.0157). 76% of students felt that Pharmada$h was a useful learning tool. Students and workshop leaders reported that the competitive aspects helped engage and motivate students. **Implications:** The Pharmada$h format can be utilized for various topics, settings, timeframes, and levels. The game enhances student learning through increasing achievement, interest, and engagement.

**The Effect of Rolling Admissions on Quality of Student Applicants Accepted into a Pre-Pharmacy Program.** Harvey A. Jacobs, Wilkes University, Adam Welch, Wilkes University. **Objectives:** To evaluate the quality of applicants based on time of application in a “rolling” admissions process for a pre-pharmacy guaranteed seat program (PPGS). **Method:** Four years (classes of 2016-2019) of retrospective, de-identified data were collected on applications to a PPGS program categorized by month of application (Oct-Feb). Applicant quality was determined by math SAT score and a normalized combination score incorporating overall SAT and class rank. The top 100 applicants from each class were further categorized based on “early” or “late” application and acceptance status (early = application received when seats were still available). This process identified “late” applicants that may have been excluded by being immediately placed on a wait-list. An ANOVA compared SAT score and a Kruskal-Wallis test compared combo score using IBM SPSS Statistics 19 (Armonk, NY). **Results:** There were 881 total applicants with a distribution per month as follows: Oct = 23.0%, Nov = 23.8%, Dec = 19.5%, Jan = 21.4%, and Feb = 12.2%. There was no significant difference on math SAT between months (p = .071) but a significant difference was found on the overall SAT and class-rank combo score (p < .001). When the top 100 applicants each year were compared, on average 10% of applicants were excluded because of late applications. **Implications:** Rolling admissions allows for a quick evaluation and approval process for applications with the apprehension that qualified but late applicants may be excluded. This study suggests that high quality applicants were retained during the early part of the application process and only 10% of seats were excluded to “late” applicants.

**The Pharm.D. Program in India: An Opportunity for Collaboration.** Christine R. Birnie, St. John Fisher College. **Objectives:** With the recent approval of the Pharm.D. program in India, many Indian pharmacy schools have been quick to develop such programs. This project evaluated the recent exponential growth and the current status of Pharm D programs throughout India. **Method:** During a four month sabbatical experience in India, five newly developed Pharm.D. programs throughout the country were visited. Curricular content, faculty expertise, program development, clinical sites, accreditation and pedagogy were observed and documented. Additional program information was obtained from the Pharmacy Council of India (PCI). **Results:** Over the past six years, 143 of the 928 degree-granting pharmacy schools in India have developed Pharm D programs. The curriculum and course guidelines were established and are governed by the Pharmacy Council of India (PCI) resulting in a 6-year curriculum, including 5 years of didactic coursework and one year of experiential education. The curriculum maintains a strong emphasis on the basic pharmaceutical sciences, with courses including pharmacognosy, pharmaceutical analysis, and medicinal chemistry, and limited instruction devoted to clinical skill development, physical assessment, communication and patient counseling. With very few trained Pharm.D.’s currently in India, colleges have recruited limited pharmacy practice faculty and have few established practice sites. **Implications:** With the swift expansion of Pharm.D. programs internationally, US pharmacy schools have the potential to provide the much needed support for young programs in developing countries. The potential for faculty and student exchanges, collaborative programs and expert consultation provides the needed support for developing programs while enriching US programs with valued cross-cultural experiences.

**Using Web-Based Clicker-Like Technology for Enhancing Learner-Centered Acquisition of Complex Immunosuppressive Therapy.** Ashim Malhotra, Pacific University Oregon. **Objectives:** Practicing pharmacists routinely make therapeutic judgments based on a multitude of factors. Pharmacy students oversimplify the plurality of justifiable therapeutic responses by reducing therapeutic options to one “correct”, rather than the “best-fit”, scenario. Our overall objectives for this study were to (i) enable students to recognize the validity of multiple therapeutic solutions, (ii) select the most appropriate therapy, and (iii) demonstrate an understanding of the fundamentals of immunology. **Method:** Following completion of Immunology curriculum, student performance was assessed, providing a benchmark prior to the activity. A complex patient case requiring immunosuppressive therapy was presented, with 15 follow up questions, answers to which were displayed through Poll Everywhere. Students entered individual responses by texting the code corresponding to their choice to the Web based applet. Class answers were displayed in real time. This identified
areas of collective weakness, which were addressed by a faculty-lead discussion. A final assessment was administered ExamSoft. A survey instrument was designed to collect student feedback. Results: Overall student performance improved following the activity, as reflected by an increase in the average score on the second assessment compared to the first. Student performance also improved on the Understanding, Application and Analyzing sections of the assessment, as per Bloom’s taxonomy. The activity had a high overall satisfaction score based on Likert scale data collected from the student survey, with a majority of responders suggesting a repeat next semester. Implications: Mass, real-time visual data help in enhancing learner experience, comprehension and performance on difficult therapeutic problems.

VCU BEST (Broadening Experiences for Scientific Training) and Professional and Personal Student Development. Susanna Wu-Pong, Virginia Commonwealth University, Suzanne E. Barbour, Virginia Commonwealth University, Victoria A. Shivy, Virginia Commonwealth University, Rosalyn H. Hargraves, Virginia Commonwealth University, Joseph A. Testani, Virginia Commonwealth University, Joyce A. Lloyd, Virginia Commonwealth University, William J. Korzun, Virginia Commonwealth University, Mark J. Schaefermeyer, Virginia Commonwealth University, Aron H. Lichtman, Virginia Commonwealth University, Ann M. Nichols-Casebolt, Virginia Commonwealth University. Objectives: The VCU BEST Program was developed to provide VCU professional, graduate, and postdoctoral students career and professional development to supplement their curricula. The goal of BEST is to transform the culture of biomedical scientist training at VCU by developing AEGDS, a training platform that broadens student awareness of potential careers, provides opportunities to experience career paths, provides guidance for career path(s) selection, allows students to develop the skills sets necessary to be successful, and encourages students to share their experiences, thereby broadening exposure of others in the community. Method: BEST is an optional 5-6 credit certificate program offered over 3-4 semesters and was built around the School of Pharmacy’s Professional and Personal Development course (now GRAD611) and Pharmacy’s Career Mentor Network programs. BEST includes a Nontraditional Career Seminar course, shadowing, experiential learning, project team electives, career course electives, and vocational counseling, faculty, peer and career mentors. GRAD611 has four parts: self-assessment, personal brand, motivating yourself and others, and managing professional relationships and was assessed using self-assessment student ratings. Results: Assessments from the GRAD611 pilot and first VCU-wide course offering demonstrate significant changes in student comfort with the learning objectives with each module and a strong impact of the program on the students. Implications: We envision that AEGDS-trained students will be better prepared to select the right career paths, work in interdisciplinary teams in those careers, and mentor other aspiring biomedical scientists. The outcomes from GRAD611 suggest increased student comfort and capability with self-knowledge, personal brand, motivating oneself and others and managing relationships.

Which Type of Balance do Pharmacists Use in Compounding: Torsion or Digital? Rhonda Bilger, St. Louis College of Pharmacy, Noha Salama, St. Louis College of Pharmacy, Rasma S. Chereson, St. Louis College of Pharmacy. Objectives: Historically, torsion balances have been utilized in pharmacies to weigh ingredients for compounding. In an effort to support current practice in the Pharmaceutics lab, this study aimed to determine the types of balances used in compounding pharmacies: torsion or digital. Method: A survey was mailed to the pharmacist-in-charge at 698 pharmacies, representing 47% of the pharmacies in Missouri as of July 2013. The pharmacies were randomly selected and stratified by region into eight regions to ensure a representative sample. Information was gathered regarding the type and use of balances and pharmacists’ perspectives on the need to teach torsion balance technique to pharmacy students. Results: The response rate for the survey was 53.3%. Out of the total responses received, those pharmacies having a torsion balance, digital balance or both are 46.8%, 27.4% and 11.8%, respectively. Sixty-eight percent of responders compound prescriptions. The study showed that 52% of compounding pharmacies use torsion balances in their practice. Of those with a balance in their pharmacy, 65.6% favored continuation of torsion balance instruction. Implications: Digital balances have become increasingly popular and have replaced torsion balances in some pharmacies, especially those that compound a significant number of prescriptions. The results of this study indicate that torsion balances remain integral to current compounding practice. Therefore, students should continue being taught torsion balance technique at the College.

PHARMACY PRACTICE

Completed Research:

A Health Care Learner’s Guide to Medication Assistance Programs. Janice R. Frueh, Southern Illinois University Edwardsville, Tara Warren, Dana Constant, Southern Illinois University Edwardsville. Objectives: To develop an educational tool to increase awareness and knowledge about medication assistance /access resources. Method: A series of interviews with community organizations including charities, the health department, federally-qualified health centers, hospitals, and community pharmacies was conducted to determine local, regional, and national medication assistance resources being offered and/or that patients were being referred to. A qualitative data analysis was completed to sort medication assistance programs into two categories: #1. Acute Medications (defined as a medication that is newly prescribed (used for < 1 month), needed to prevent a hospitalization, or an antibiotic) and #2. Long-Term Medications (defined as a medication used to control a disease state or condition that must be taken consistently for > 1 year). Results: Fourteen organizations offering medication assistance services were interviewed. A “Medication Assistance Toolkit” was developed in order to organize and communicate information about available medication assistance programs. The toolkit includes a 20-minute didactic lecture, two flow sheet tools for learners to navigate acute or long-term medication assistance programs, practice exercises for the flow sheet tools, a resource document providing detailed information on services, requirements, and helpful tips about medication assistance programs, and a patient handout. Implications: Numerous medication assistance resources are available in the Springfield, IL community. Navigating these programs can be challenging and complex. This educational tool may be utilized in co-curricular, didactic, and/or experiential learning environments to enhance health care learners understanding about medication assistance /access programs.

A Peer-led Student Group Program to Provide Academic Assistance to Students in the Didactic Curriculum. T. Vivian Liao, Mercer University, Angela O. Shogbon, Mercer University. Objectives: To evaluate the performance of students who participated in a peer-led student group review sessions designed to provide academic assistance in a pharmacy curriculum. Method: The Rho Chi Academic Honor Society at our institution implemented a peer-led academic assistance
A Renal Replacement Therapy (RRT) Simulation to Strengthen Essential Pharmacist Skills. Erini S. Serag-Bolos, University of South Florida, Aimon C. Miranda, University of South Florida, Shyam Gelot, University of South Florida. Objectives: The Accreditation Council for Pharmacy Education (ACPE) considers professional communication, informatics, pharmacist-provided care for special populations, drug information, and literature evaluation as essential curricular components. This simulation incorporated such elements for application of didactic material and the objectives were to utilize electronic medical records (EMRs) to develop a SBAR (Situation, Background, Assessment, Recommendation) note, utilize appropriate resources to verify medication orders for a chronic kidney disease (CKD) patient, and verbally respond to drug information questions.

Method: The activity consisted of a didactic component discussing RRT modalities, a pre- and post-assessment, a simulation, and a debrief session. Fifty third-year pharmacy students worked in groups of five and rotated through four stations. The first station involved verification of infusion orders. In the second station, verification of a peritoneal dialysis bag and response to a drug information question. The third station consisted of order verification, pharmaceutical calculations for CRRT, and a drug information question. The last station entailed a standardized patient interview for a new hemodialysis patient utilizing an EMR and development of an SBAR note.

Results: Forty-seven students completed the pre-assessment and fifty students completed the post-assessment. Average time to complete the assessment, respectively, was 7 versus 5 minutes. Mean score was 4.64 (± SD 1.6) versus 7.65 (± SD 1.32) out of 10. The average number of questions correct was 1.69 versus 3.61. Implications: The RRT simulation exposed students to the various pharmacist roles and considerations in caring for patients with CKD. Future modifications to this activity include an addition of an interprofessional component.

A Pharmacy Academic APPE Improves Outcomes in a College of Education Course Focused on Chronic Illness. Michael W. Neville, The University of Georgia, Deanna W. McEwen, The University of Georgia, Yvette Q. Getch, Western Kentucky University. Objectives: The primary objective of this study was to evaluate the effectiveness of asthma and diabetes teaching modules taught by fourth year pharmacy students to undergraduate and graduate students enrolled in a College of Education course.

Method: This IRB-approved study attempted to evaluate the primary outcome via paper questionnaire. All University of Georgia College of Education students enrolled in a course, Teaching and/or Counseling Children With Chronic Illness or Medical Conditions in the Fall of 2012, were invited to participate. Twenty-six questions evaluated perceived changes in attitudes, knowledge, and self-perceived skills using a Likert-scale. The questionnaire was administered during the course orientation. Pharmacy students on academic APPE constructed and delivered modules that contained didactic material, application of skills, and simulation during the 15 week course. The questionnaire was administered again at the conclusion of the semester. Changes in pre-and post-questionnaire mean scores were analyzed using Wilcoxon Signed Ranks.

Results: Thirty-seven (11 graduate, 26 undergraduate) University of Georgia college of education students were invited to participate. Twenty-seven (72.9%) completed the pre- and post-education questionnaire. Significant changes (p<0.05) were observed in 6 of 8 (75%) knowledge, 8 of 8 (100%) self-perceived skills, and 2 of 8 (25%) attitude questions, respectively. Implications: Academic APPEs can provide rich opportunities for pharmacy students to showcase their skills and to successfully educate those in other disciplines.


Method: Third-year Doctor of Pharmacy students enrolled in a Pharmacotherapy Laboratory course completed a case scenario module consisting of a medication assessment and documentation of a subjective-objective-assessment-plan note. Two lab sections used a paper case (N=53); three sections used an online virtual case simulation (N=81). All students submitted a SOAP note through the online course management system. Students voluntarily completed pre/post surveys to measure confidence (13-item 4-point unipolar scale). The simulation group completed post-module questions related to realism and engagement of the simulation compared to previously completed paper cases (14-item scale; 0=strongly disagree, 4=strongly agree). Between group assessments were performed using paired t-tests.

Results: Response rates for pre/post surveys were 85% and 86%, respectively. Student confidence summed scores significantly improved in both groups following module completion (p<0.0001). No statistical difference was found when comparing the change in post- and pre-module confidence summed scores between the groups. Comparing the simulation to a paper case (mean [SD]), students reported increased interest (2.8 [1.1]), enjoyment (2.8 [1.0]), relevance (2.7 [1.0]) and realism (2.8 [0.9]). Additionally, students reported the simulation was realistic to what may be encountered in clinical practice (2.7 [0.8]). Implications: Online patient case simulations may result in increased student engagement and realism compared to traditional paper cases, but offer no benefit over paper cases in improving student self-confidence in providing medication management.

A Structured Advanced Clinical Experience “ACE” Program for Fourth Year Pharmacy Students. Timothy P. Gauthier, Nova Southeastern University, Venessa Price-Goodnow, Jackson Memorial Hospital, Department of Pharmacy, Douglas L. Jennings, Nova Southeastern University, Joshua Caballero, Nova Southeastern University, Marta A. Miyares, Jackson Memorial Hospital, Department of Pharmacy, Brian Sedam, Jackson Memorial Hospital, Department of Pharmacy, Christopher Morrison, Jackson Memorial Hospital,
Department of Pharmacy. **Objectives:** To describe outcomes of an advanced clinical experience (ACE) training program for fourth-year pharmacy students at a large academic-affiliated tertiary care center. **Method:** Nova Southeastern University’s College of Pharmacy (NSU-COP) and Jackson Memorial Hospital’s Department of Pharmacy (JMH-DOP) developed a structured ACE Program incorporating six consecutive APPEs at JMH. Six spots are offered annually and interested students complete a formalized application in the fall of their third professional year. Program requirements include completion of a residency-focused NSU-COP elective course, clinical skills checklist, longitudinal project and monthly personal reflections. Successful matching to post-graduate training was tracked. **Results:** Since inception in 2010, 18 students have participated. All students completed an APPE with an NSU-COP faculty member and 13 JMH-DOP clinical pharmacists have served as preceptors. Thirteen projects have been completed, contributing to $145,000 in cost-avoidance, identification of $263,000 in potential cost savings, optimization of clinical services, enhancement of patient care, and four peer-reviewed publications. All projects resulted in poster publication at a national pharmacy meeting. While not all participants pursued postgraduate training, eight of nine students (89%) who applied secured a position, while the remaining 6 are currently pursuing post-doctoral training. All 2013 students rated their overall satisfaction with the ACE Program as “most satisfied” and “strongly agreed” it enhanced their ability to apply knowledge, skills, and attitudes needed for evidence-based, patient centered medication therapy management. **Implications:** An ACE program is a viable mechanism for enhancing clinical pharmacy education and producing services which benefit the student, clinical site, and college of pharmacy.

**Academic Outcomes and Attitude of Pharmacy Students Regarding Flipped Classroom Teaching in Gastroenterology.** Lukas Everly, Katherine Cochran, *The University of Findlay. Objectives:* To investigate whether the impact of a flipped classroom instruction model would improve student performance and perception. **Method:** Pharmacy students enrolled at the University of Findlay College of Pharmacy are split into two sections within each academic year. A lecture covering Acute and Chronic Pancreatitis was recorded and uploaded online for students in the afternoon session to review before class. Students in the morning class were instructed using the same presentation in the classic lecture format while the students in the afternoon session spent classroom time completing an active learning activity consisting of two guided patient cases. Student performance was assessed by nine exam questions covering the presented material while perception was measured through a 10-item survey regarding their thoughts on the flipped classroom model. **Results:** Student performance did not differ significantly between teaching styles. Qualitative results of the survey administered at the end of the class revealed greater student support for reviewing recorded video lectures over pre-class readings (66.7% versus 33.3%) and in using class time for active learning exercises (64.1% versus 35.9%). **Implications:** A flipped classroom model promotes greater learner independence and furthers active learning opportunities, but barriers remain in appropriate implementation to improve student performance without increasing aggregate student workload.

**Adaptation and Validation of a Health Professional Ethics Rubric.** Therese I. Poirier, Southern Illinois University Edwardsville, Sarah Wagner, Southern Illinois University Edwardsville. **Objectives:** To adapt and validate an ethics rubric previously published for health professional students. **Method:** The rubric was assessed by scoring four different ethics cases submitted by 16 teams comprised of 80 pharmacy and 50 dental students. Rubric scoring debriefing sessions comprised four raters, two of whom consistently evaluated all four cases, while the remaining two raters varied for the different cases. Each debriefing session was used to revise the next version of the rubric. A debriefing score for all components of the rubric was calculated and compared with each of the scores from the two consistent rater at each rubric iteration. Pearson’s correlations were calculated for the following components of the ethics rubric: identifying ethical issues, ethical principles, options, analysis of options, solutions, and total case scores. **Results:** Four iterations of the rubric were essential to obtain the highest Pearson’s correlations. Pearson’s correlations for the fourth iteration of the rubric ranged from 0.806 to 1.00 for identifying the issues, ethical principles, and options for both consistent raters. However, for analysis, recommending solutions, and total case scores, the correlations ranged from 0.815 to 0.952 for one rater and 0.449 to 0.465 for the second rater. **Implications:** The iterative debriefings and validations of the ethics rubric resulted in an instrument that is ready for an interprofessional team to use and further validate. The iterative process used reaffirms that training in use of a rubric is still necessary prior to being used.

**Allocating E-lecture Contact Hours in a Pharmacy Elective Course.** Sean M. Mirk, Midwestern University/Downers Grove, Jennifer Phillips, Midwestern University/Downers Grove, Sally Arif, Midwestern University/Downers Grove, Christie Schumacher, Midwestern University/Downers Grove, Nicole Rockey, Midwestern University/Downers Grove. **Objectives:** To compare time reports from an e-learning reporting program to students’ self-reported time and allocated contact hours. **Method:** As part of a team-taught Ambulatory Care pharmacy elective course, third-year pharmacy students completed three e-lectures (EL1, EL2 and EL3). Faculty members collaborated together to develop the e-lectures. A predetermined number of contact hours were allocated to each e-lecture (EL1 = 1.0, EL2 and EL3 = 1.5 each). The e-lectures, developed using Storyline®, required active engagement with the content; included videos and images; and utilized multiple-choice questions and scenario-based learning. Articulate Online® was used to capture time spent completing the e-lectures. Students self-reported their estimated time. All time measurements were converted to contact hours and descriptive statistics were used to analyze the data. **Results:** All students enrolled (n = 27) consented to participate. Based on time reports, students spent an average of 3.8 contact hours (SD = 0.5) completing all three e-lectures. The average number of contact hours spent completing each e-lecture was comparable to predetermined contact hours (contact hours, SD): 1.05 (0.37), 1.48 (0.48), and 1.27 (0.56), respectively. On average, students viewed each e-lecture three to four times. Compared to time reports, students reported a higher number of contact hours (4.7, 0.42) to complete all three e-lectures. **Implications:** With appropriate planning and collaboration, faculty members can develop online content that is equivalent to allotted contact hours. Students may perceive the time spent completing the e-lectures to be higher based on recent views of the content.

**An Active-Learning Laboratory on Respiratory Devices.** Krista L. Donohoe, Virginia Commonwealth University, Nancy S. Yunker, Virginia Commonwealth University, Laura Morgan, Virginia Commonwealth University, Yaena M. Min, Virginia Commonwealth University, Punam H. Patel, Virginia Commonwealth University. **Objectives:** To implement and evaluate an active-learning laboratory activity to teach pharmacy students about appropriate use of various respiratory devices including proper inhalation technique, device maintenance and counseling points. **Method:** The laboratory session was divided into 4 respiratory stations: nebulizers, COPD exacerbation.
An Elective Course on Pathogens and Toxins. Seher A. Khan, Lake Erie College of Osteopathic Medicine. Objectives: To develop, implement and assess an elective course on pathogens and toxins. Method: A 2-credit hour elective course entitled “Poisons and Toxins” was offered to the second year pharmacy students (n=9) for the first time in 2013. The course was aimed to introduce students to biological agents capable of causing mass destruction. Course topics included particular infectious diseases (e.g.-anthrax, tularemia) and natural toxins (e.g.-ricin, shigatoxin) characterized by the EPA and CDC as lethal with potentials for terror attacks. The course was offered in a facilitated learning format where students were provided with the materials for self-learning on a particular topic a week in advance of the class meeting. On the following week, students were asked to discuss the topic amongst themselves with the instructor serving as a facilitator. Learning was assessed by weekly quizzes and class participation. At the end of the course, students completed course evaluations using a 7 point Likert scale (1=strongly disagreed and 7= strongly agreed). Results: Students reported that the course was organized (6.33/7) and course materials were valuable (5.83/7). Students believed that the course objectives and goals were clear and understandable (6.33/7). A majority of the students (83.4%) understood the purpose of this course. In addition, comments were made for further improvement of the course content. Implications: Given the enormous capacity of noxious agents to cause mass casualty, this course attempted to enlighten future pharmacists on agents of bioterrorism. Overall, the course was well-received by students. Future modifications will include emergency procedures and clinical case studies.

An Interprofessional Faculty Seminar Focused on Interprofessional Education. Therese I. Poirier, Southern Illinois University Edwardsville, Miranda J. Wilhelm, Southern Illinois University Edwardsville. Objectives: To evaluate an interprofessional faculty seminar which included the Schools of Dental Medicine, Medicine, Nursing, Pharmacy, and other health educators. The purpose of the seminar was to explore the topic of interprofessional education (IPE) as a way to encourage dialogue and identify opportunities for collaborations among health professional programs. Method: The seminar consisted of a review of IPE presentation, poster session highlighting existing IPE endeavors, sharing of potential IPE opportunities, and thematic round tables for achieving IPE competencies. Participants were assessed using a pre-seminar IPE knowledge quiz consisting of concepts that would be addressed during the seminar (maximum score 12) and the readiness for interprofessional learning scale (RIPLS) (maximum score 95). Post-assessments consisted of the same IPE knowledge quiz and a perception survey regarding the seminar. Results: Fifty-four health professional faculty attended the seminar including 7.4% dental medicine, 11.1% medicine, 37% nursing, 35.2% pharmacy, and 9.3% others. Significant differences in the IPE knowledge quiz
was noted when comparing pre-assessment (mean = 5.14) and post-assessment scores (mean = 8.45). The mean score for faculty on the RIPLS was 84.86 (SD = 7.69). In comparing RIPLS and subscale scores of faculty to students for other IPE endeavors, significant differences in scores were noted. Faculty scores were higher than those compared to students. A perception survey indicated that seminar goals were achieved. **Implications:** The seminar was well received and achieved its purpose. Participants identified opportunities and networked for future collaborations.

**Analysis of a Continuous Quality Improvement Curriculum.** Todd A. Brown, Northeastern University; Jennifer Kirwin, Northeastern University; Colin Gillis, Northeastern University; David P. Zgarrick, Northeastern University. **Objectives:** Community pharmacy practice continues to be a common career path for pharmacy graduates. In 2013 68% of our students entered community pharmacy practice upon graduation. A vital skill for community pharmacists is the ability to apply continuous quality improvement (CQI) principles to pharmacy dispensing errors. Massachusetts law requires that community pharmacists implement a continuous quality improvement program to enhance patient safety and eliminate or reduce future errors. This project sought to determine if students felt the curriculum taught the knowledge and skills necessary for students to implement a medication error reduction CQI program in a community pharmacy setting. **Method:** An in-class lecture and active learning materials were developed for P3 students based upon the Institute for Safe Medicines Practices Improved Medication Safety in Community Pharmacy Program. Students were asked to complete web-based pre- and post-surveys about their experience and confidence in implementing a CQI analysis. Anonymous unique identifiers linked pre- to post-survey results. The Related-Samples Wilcoxon Signed Rank test was used to compare pre- and post-responses. **Results:** Course assessments evaluated students’ performance on activities and provided information about achievement of learning objectives. Pre-course surveys generally indicated a low experience or comfort with the CQI process. Post-course surveys indicated a significant improvement in both comfort and understanding. **Implications:** CQI is a necessary process for the improvement of care delivery in a community pharmacy setting. A lecture with a subsequent active learning activity can be effectively used to both improve student understanding and comfort with CQI analysis.

**Analysis of Time Spent Teaching by Pharmacy Practice Faculty at a New College of Pharmacy.** Kamila A. Dell, University of South Florida; Jaclyn Cole, University of South Florida; Sheetal P. Dharia, University of South Florida; Carol Fox, University of South Florida; Aimon C. Miranda, University of South Florida; Erini S. Serag-Bolos, University of South Florida; Kristy Shearer, University of South Florida; Sarah Steinhardt, University of South Florida; Gwendolyn Wantuch, University of South Florida; Wendy Udpke, University of South Florida. **Objectives:** Document trends in teaching time of pharmacy practice faculty throughout the development of a new college of pharmacy. **Method:** An Excel-based workload tracking tool was developed to track teaching components of pharmacy practice faculty workload. Faculty members voluntarily utilized the workload tracking tool since August 2011, the same time the first class matriculated at the college. Documented teaching components include lecture preparation, lecture delivery, course administration, and professional development. Faculty members tracked their time to the nearest 15 minute increments for up to 2 years. Individual faculty data was compiled and analyzed in aggregate utilizing descriptive statistics. **Results:** During the first two years of the college, the percentage of time devoted to teaching was 38% of the total faculty workload. Most of the teaching activity (42%) was spent on administration. Administration related activities encompass course development including syllabus, assignment, exam, and rubric creation, as well as grading, proctoring, and other such activities. Preparation for teaching, which is lecture creation or revision, was 36% of the time, while only 12% of faculty time was actually spent face to face with students. Professional development about teaching accounted for 5% of the time and 5% was spent on other activities related to teaching. The distribution varied by semester. **Implications:** The time distribution may be expected to change as the program grows. Quantification of time allotment to teaching may help other colleges, both new and established, with resource planning.

**Assessing P2-pharmacy Students’ Ability to Identify Drug-related Problems using Different Methods.** Gail B. Rattinger, Fairleigh Dickinson University; Anastasia M. Rivkin, Fairleigh Dickinson University; Abdillahi Mohamed, Fairleigh Dickinson University; Antonia Carbone, Fairleigh Dickinson University; Nina Elk, Fairleigh Dickinson University; Pamela Giordano, Fairleigh Dickinson University; Dongmi Kim, Fairleigh Dickinson University; Tae Eun Park, Fairleigh Dickinson University; Michael J. Avalroni, Fairleigh Dickinson University. **Objectives:** The Accreditation Council for Pharmacy Education developed eleven competencies pharmacy students must demonstrate prior to starting their Advanced Pharmacy Practice Experiences (APPEs). Pre-APPE competencies are an integral part of Fairleigh Dickinson University School of Pharmacy’s ongoing learning outcome assessment plan. One such pre-APPE competency is “Identification and Assessment of Drug-Related Problems (DRP)”. Our objective was to determine P2-students’ ability to identify DRP using two different assessment methods. **Method:** We assessed P2-students’ (N = 74) abilities to correctly identify DRP using two assessment methods. Students were asked to identify DRP by: (1) Collecting patient medication history from interviewing simulated patients and use this information to identify DRP and; (2) Providing students patient vignettes and use this information to identify DRP. Students’ abilities to identify DRP were categorized as weak, competent or strong with passing set at a competent or strong score. Analysis used descriptive statistics (McNemar’s test). **Results:** Students’ abilities to correctly identify DRP were similar using either assessment method [patient medication history (60.8%) versus patient vignette (64.9%) method (p = 0.36)]. The majority of students achieved passing scores on either patient medication history or patient vignette assessments (82.4%) while many (43.2%) students achieved passing scores on both assessments. **Implications:** While a majority of students achieved passing scores with one or the other assessment, having two attempts improved their chances of passing. Method of assessment did not change the assessment outcome for this competency. Several limitations, including variability in case difficulty, may need to be controlled for in the future.

**Assessing the Impact and Perceptions of Electronic Testing in the Pharmacy Curriculum.** Brianne L. Dunn, South Carolina College of Pharmacy; Jennifer G. Schnellmann, South Carolina College of Pharmacy; Patricia H. Faber, South Carolina College of Pharmacy; Jun Wu, South Carolina College of Pharmacy; Philip D. Hall, South Carolina College of Pharmacy. **Objectives:** Assess and evaluate the impact of computer-based examinations as it relates to personal expectations, student performance, faculty productivity, and resource utilization. **Method:** Electronic testing was implemented in fall 2013. Four required courses for first year pharmacy students transitioned from paper to computer-based assessments. A survey was administered to students and faculty in order to assess attitudes towards the new exam delivery.
Assessing the Utility of Social Media in Pharmacy Education. Leslie A. Hamilton, The University of Tennessee, R. Eric Heidel, University of Tennessee Medical Center, Sharon K. McDonough, The University of Tennessee, Andrea S. Franks, The University of Tennessee, Katie J. Suda, Department of Veterans Affairs, Center of Innovation for Complex Chronic Healthcare. Objectives: Today’s student pharmacists have had significant exposure to social media in their pre-pharmacy educational experiences. With the advent of online learning methods and integration of technology into pharmacy education, social media may be a novel method for administering pharmacy curricula to students. The purpose of this study was to evaluate the use of social media for educational purposes by student pharmacists and its impact on professionalism. Method: An anonymous 36-question online survey was administered to third-year students enrolled in the Drug Information and Clinical Literature Evaluation course. Frequency statistics were used to describe student use of social media. Results: A total of 160 students completed the survey (92% response rate). Approximately 75% of students reported using social media for courses during their pharmacy curriculum. Most (66.9%) reported that they were connected to the majority of their classmates through social media, while 85% believed that social media was valuable to their academic success and more than 44% preferred social media over online discussion boards. However, approximately 41% of students agreed that their academic and social lives should be separate. While 49.4% believed it was appropriate to be connected to professors via social media for academic reasons, only 21.3% thought it was appropriate for personal reasons. Implications: Pharmacy students actively use social media, which could be a valuable avenue for delivering or supplementing pharmacy curricula. The potential role of social media in pharmacy education needs to be further explored for its pedagogical, professional, and ethical utility.

Assessment of Physical Examination Instruction at Concordia University Wisconsin School of Pharmacy. Laura Traynor, Concordia University Wisconsin, Beth M. DeJongh, Concordia University Wisconsin, Christian B. Albano, Concordia University Wisconsin, Nicia Lemoine, Concordia University Wisconsin. Objectives: Determine the instructional design and evaluation methods used for physical examination at Concordia University Wisconsin School of Pharmacy (CUWSOP); Elucidate CUWSOP faculty opinions regarding competency expectations in the performance and application of physical exam skills for the purpose of graduation and licensure; Compare physical examination instruction at U.S. pharmacy schools with that of CUWSOP. Method: This curricular improvement initiative was considered exempt by the CUWSOP Institutional Review Board. An existing physical examination survey used by researchers from the University of Kentucky was adapted for use. Faculty members at CUWSOP, selected via purposive sampling, completed an electronic survey on the level of physical examination instruction provided in their courses and their opinions regarding the need for such instruction. Results: The survey response rate was 85.7%. Didactic instruction of physical examination occurred for each organ system. Formal evaluation of physical examination technique occurred for vital signs only. Faculty members agreed or strongly agreed (67%) that pharmacy students should be required to demonstrate correct performance of physical examination techniques via a competency exam prior to graduating, with the most common responses being vital signs (100%), pain assessment (75%), and diabetic foot examinations (67%). Implications: CUWSOP requires demonstration of physical examination skills for fewer organ systems than the majority of pharmacy schools who participated in a national physical examination survey. The results will be used by CUWSOP faculty to evaluate future delivery of physical examination instruction. Future research may explore physical examination instruction during experiential education and the role of interprofessional education in physical examination instruction.

Assessment of a Multi-Preceptor Approach to Ambulatory Care Topic Discussions. Katie S. McClendon, The University of Mississippi, Scott S. Malinowski, The University of Mississippi, James J. Pitcock, The University of Mississippi, Meagan M. Brown, The University of Mississippi, Courtney S. Davis, The University of Mississippi, Justin J. Sherman, The University of Mississippi, Daniel M. Riche, The University of Mississippi, Lauren S. Bloodworth, The University of Mississippi, Laurie E. Warrington, The University of Mississippi. Objectives: To assess the impact of a multi-preceptor approach to facilitating topic discussions on students’ knowledge and confidence in clinical decision making during an ambulatory care advanced pharmacy practice experience (APPE). Method: Eleven faculty with particular expertise and experience facilitated 7 ambulatory care topic discussions with fourth professional-year pharmacy students over the 5-week long APPE during one academic year. Topics covered were diabetes, hypertension, hyperlipidemia, heart failure, anticoagulation, devices/physical assessment, and asthma. A self-assessment survey and knowledge assessment was administered before and after discussions. Pretest and posttest means were compared using a Student t-test for paired, 2-tailed data. Results: Students’ examination scores increased significantly (p<0.001) from 59.1 ± 13.9% at baseline to 76.5 ± 12.6% at the end of the 5 week experience. The majority of participants indicated that they were comfortable making therapeutic decisions regarding medication use as it related to the discussion topics, with the exception of heart failure. Implications: Participating in topic discussions led by faculty with expertise and experience for each ambulatory care topic was associated with a significant improvement in knowledge assessment scores and may be a model for other APPE types and distance learning. Faculty appreciated the more efficient use of time in discussions and students were able to participate in discussions led by content experts. While having shared discussions takes some faculty coordination, the net decrease in time is beneficial.

Assessment of a Peer Evaluation Instrument in a Team-Based Learning Course. Joy Wahawisan, Texas A&M Health Science Center, Miguel Salazar, Texas A&M Health Science Center, Mark
Assessment of a Patient Case Simulation on Interprofessional Perception and Learning. Madison. Assessment of the reliability of a peer evaluation instrument used in a longitudinal team-based learning pharmacotherapy lab. Published literature is lacking on the reliability of this widely used method of peer evaluation.

**Method:** As part of the team-based learning process, third-year student pharmacists are instructed to evaluate the contributions of their peers by assigning a numerical value to each of their team members. The peer evaluation tool has two stipulations: (1) students are given a set number of points to distribute within their team, and (2) not all members are to receive the same point value. Numerical evaluations were analyzed for the variance of the scores in each group of students by identifying low, median, and high scorers within each group, and calculating the mean and standard deviations of the scores. ANOVA was used to analyze differences between group means, and agreement between performance ratings within each group of students was assessed via intra-class correlation coefficient analysis using a one-way random effects model.

**Results:** Overall, given the range of scores students could give each other, we found little variation in the standard deviation from the score means in the high, median, and low scorers within each group. We found no statistically significant difference in the overall means (p=0.82). The intra-class correlation coefficients and the corresponding p-values showed a strong concordance amongst raters. **Implications:** Our findings suggest that our peer evaluation instrument methodology provides a reliable process for peer assessment in a team-based learning setting.

**Assessment of Interprofessional Perceptions and Learning.** Susanne G. Barnett, University of Wisconsin-Madison, Paula A. Jarzemske, University of Wisconsin School of Nursing. Objectives: To evaluate pharmacy and nursing students' professionally oriented perceptions, attitudes, and readiness towards interprofessional learning before and after completion of an interdisciplinary simulation exercise. **Method:** Pharmacy and nursing students were invited to complete a survey before and after participating in a patient case simulation, using SimMan® technology, for which they formed five interdisciplinary groups of eight students. Survey questions were adapted from previously validated interprofessional surveys and used subsets of questions (teamwork and collaboration, professional identity, roles and responsibilities, competence and autonomy, perceived need for cooperation, perception of actual cooperation, and understanding other’s values). Questions used a 5-point Likert scale ranging from strongly disagree or not important to strongly agree or extremely important. Between-group assessments were performed using paired t-tests. **Results:** Forty (100%) and 39 (98%) of students completed the pre- and post-surveys, respectively. A statistically significant improvement in student perceptions was seen in 17 of 38 survey questions with the majority of improvement seen in the teamwork and collaboration and perception of actual cooperation domains. No statistical differences were found when comparing the change in post- and pre-simulation scores between pharmacy and nursing disciplines. After completion of the simulation, students were asked to compare the importance of interprofessional learning “before participation” and “now”. Both disciplines reported a numerically increased importance (p<0.001). **Implications:** Participation in an interprofessional simulation appears to have significantly altered students’ perception and attitudes towards interdisciplinary learning and members of other healthcare professionals.

**Assessment of a Wellness Initiative to Engage Healthy Behaviors in an Academic Environment.** Elizabeth M. Urteaga, University of the Incarnate Word. Objectives: To assess the willingness of participation to justify the addition of a wellness program in an insured population. Published literature is posed benefits of incorporating a wellness program in an insured population. **Method:** Fifty benefit eligible employees, their spouses and dependents, age 18 years of age or older were eligible to participate in this study. Each participant completed a biometric screening, including a full lipid panel, glucose, blood pressure, height, weight, and waist circumference. Each participant was provided a personal health coach to help set specific measurable goals. **Results:** Fifty employees or spouses (18% male, 82% female; mean age 45.9 years) completed the biometric screening. Seventy-eight percent were noted to have one or more unhealthy biometric measures. Eighty-six percent were overweight/obese based on body mass index. All 50 participants completed at least one health coach session and 39 attended at least four out of the five sessions. Eight months after the initial biometric screen the number of participants noted to have one or more unhealthy biometric measures declined to 69%. Ninety-seven percent of participants noted benefit from completing the program and 90% would continue to participate in the program. **Implications:** The prevalence of cardiovascular and metabolic risk factors in our study are congruent with the United States as a whole, with the exception of a higher prevalence of obesity in our population. Interventions are needed to address the high prevalence of risk factors in this population. This study allowed us to assess the willingness of participation to justify the addition of a wellness component to our current benefits package.

**Assessment of Drug Information Resource Preferences and Curriculum Preparedness.** Nader Nassar, Janon Khedir Al-Tiae, Mallory McCullough, Renee Papageorgiou, Miki Goldwire, Regis University. Objectives: The intent of this study is two-fold. First to determine...
pharmacy student preferences for drug information (DI) resources and
to determine if DI skills are taught early enough in the curric-
ulum and if students feel prepared to answer DI questions on their
experimental rotations. Method: Pharmacy students have access to four
drug compendia: Clinical Pharmacology(CP), Facts & Comparisons
(F&C), Lexicomp(LC) and Micromedex(MDX). Students are intro-
duced to resources through one 2-hour laboratory session during the
fall P1-year and IPPE rotations begin spring P1-year. DI skills are
taught fall P2-year. To determine preferences and preparedness to
answer DI questions, a 22-item survey was distributed to students
(n=275). Drug compendia availability at metro area health systems
was determined through survey of practice-site faculty and students,
and through online research of hospital and clinic websites. Results: A
total of 179 (64%) students completed surveys. Micromedex was pre-
ferred: MDX:45%, LC:28%, CP:16%, F&C:11% (x2=2.53,df=3, p=0.469) and rated the easiest to use: MDX:48%, LC:28%,
CP:13%, F&C:11% (x2=11.9,df=3, p=0.008). Most students felt
prepared to answer DI questions: 66% well-prepared or very well-
prepared (P1:34%, P2:59%, P3:90%, P4:100%; x2=47.1,df=3, p=0.000). Most sites offer access to LC:71%, MDX:29%,
F&C:29%, and CP:14%. Implications: MDX is the preferred DI da-
catalogue, although LC was more readily available at Denver metro area
clinical sites, which validates the importance of teaching more than
one drug compendium to students. By the time students complete the
curriculum, they feel prepared to answer DI questions.

Assessment of Health Discipline Knowledge in Interprofessional
Education Naive Students. Maria M. Thurston, Mercer University,
Melissa M. Chesson, Mercer University, Ann M. Lucado, Mercer Uni-
versity College of Health Professions, Freida F. Payne, Mercer Universi-
ty Georgia Baptist College of Nursing, Gina J. Ryan, Mercer University. Objectives: To assess baseline student knowledge regarding
other healthcare disciplines prior to engagement in an interprofes-
sional education (IPE) exercise. Method: An IPE workshop was
developed involving pharmacy, nurse practitioner (NP), and nursing
students (n=297), in which the pharmacy and NP students were IPE
naive. Students, prior to the program, completed an eight item, multi-
ple-choice knowledge assessment of IPE and of the roles and respon-
sibilities of various healthcare professionals. Results: Eighty-eight
percent (n=262) completed the assessment and 209 surveys (70%)
were eligible for analysis. Responses from the IPE naive pharmacy
and NP students were evaluated (n=103 pharmacy and n=18 NP).
Student responses demonstrated that 89% were able to correctly define
IPE, while only 77% accurately identified activities considered to be
IPE. The roles of a pharmacist and physical therapist were correctly
identified by the majority of students (99% and 79% respectively) but
only 38% of students could identify the unique role of a public health
practitioner. Almost half (49%) of students correctly identified that NPs
and physician assistants can prescribe medications; however, less than
half of students were able to correctly select all healthcare providers
involved in administering medications in a hospital (23%) or monitor-
ing for vaccine-related adverse events (27%). Implications: IPE naive
students experienced difficulty identifying roles/responsibilities that are
shared between healthcare professions. Furthermore, there is a clear
need to incorporate public health students into future IPE offerings to
increase student knowledge and awareness.

Assessment of Perceived Stress Among Student Pharmacists. Jen-
nifer W. Beall, Samford University, Robert M. Riggs, Samford Uni-
versity, Renee M. DeHart, Samford University, John Hensley, Samford
University. Objectives: The purpose of this study was to examine
perceived stress in first through third year student pharmacists. The
secondary objectives were to examine relationships between per-
ceived stress and demographic variables (gender, year in curriculum,
age, and relationship status), to compare student pharmacist perceived
stress to the general population, and to examine student reported trig-
gers and coping strategies for stress during pharmacy school. Method:
First through third year student pharmacists at one private university
were asked to complete an IRB approved, anonymous, voluntary paper
survey during spring 2012. The survey included the 10 item Perceived
Stress Scale (PSS-10), demographic information, and questions con-
cerning stress triggers and relievers. All data was entered and analyzed
in Microsoft Excel and SPSS. Results: 242 students completed the
survey (response rate 66.4%). A bimodal distribution of mean PSS
scores was seen. The under 22 years of age and over age 32 categories
exhibited higher mean perceived stress scores. Female students
reported higher levels of perceived stress compared to their male
counterpart (p < 0.001). There was no statistical difference in per-
ceived stress among the P1, P2 and P3 classes. Class assignments and
completing electronic portfolios were the top stressors reported. Par-
ticipants most frequently reported spending time with family and
friends as ways to alleviate stress. Implications: Our current study
confirms other reports of higher perceived stress among female student
pharmacists, but does not confirm findings of differences among first
through third year student pharmacists. There was a bimodal distri-
bution of stress scores based on age.

Assessment of Student Stereotypes of Healthcare Professions
Prior to Interprofessional Education Activity Participation. Melissa M. Chesson, Mercer University, Maria M. Thurston, Mercer
University, Ann M. Lucado, Mercer University College of Health Prof-
essions, Freida F. Payne, Mercer University Georgia Baptist College of
Nursing, Gina J. Ryan, Mercer University. Objectives: To assess student stereotypes of healthcare professions prior to completion of an
interprofessional education (IPE) activity. Method: An interprofes-
sional education (IPE) activity examining healthcare-associated ethi-
cal dilemmas was developed involving students from the pharmacy
(PharmD), nurse practitioner (NP), and undergraduate nursing (BSN)
programs (n=297). Prior to the program, subjects completed a vali-
dated 27-item Student Stereotypes Rating Questionnaire (SSRQ),
which consists of a five point Likert-type scale of nine characteristics
including: academic ability, professional competence, interpersonal
skills, leadership abilities, independence, ability to be a team player,
decision-making, practical skills, and confidence. The students
assessed all healthcare professions involved in the activity. Results:
A total of 103 PharmD, 19 NP, and 87 BSN students completed the
questionnaire (70% response rate). Greater than 71% of students rated
all nine SSRQ characteristics as high or very high for each profession
involved in the activity. Ninety-nine percent of students ranked phar-
macists as high or very high in academic ability. Pharmacists were
reported higher levels of perceived stress compared to their male
counterpart (p < 0.001). There was no statistical difference in per-
ceived stress among the P1, P2 and P3 classes. Class assignments and
completing electronic portfolios were the top stressors reported. Par-
ticipants most frequently reported spending time with family and
friends as ways to alleviate stress. Implications: Our current study
confirms other reports of higher perceived stress among female student
pharmacists, but does not confirm findings of differences among first
through third year student pharmacists. There was a bimodal distri-
bution of stress scores based on age.

Attributes of the Ideal Community Pharmacy Residency Candi-
date. Gabrielle S. Lezaja, Alissa A. Scalise, Western New England
University, Eric C. Nemec, Western New England University, Joshua
**Awareness of Medication-related Fall Risk: A Survey of Community-dwelling Older Adults.** Jeannie K. Lee, The University of Arizona, Gia Leonetti, The University of Arizona. Objectives: To assess older adults’ knowledge of medications associated with an increased risk of falling and to evaluate the impact of pharmacist counseling on knowledge of medication-related fall risk. Method: Data were collected using an online questionnaire consisting of 15 knowledge-based items to determine awareness of medication-related fall risk, four items to determine pharmacist counseling experience, fall history, and number of medication prescriptions, and two items to collect demographic information. Results: Two hundred and six community-dwelling older adults (mean age 69.07 years) participated in the online survey study. The number of older adults who reported having fallen within the last five years was 90 (43.7%). The knowledge-based questions were completed by 162 older adults (80 males, 81 females, one unreported gender; mean age 68.7 years). One hundred and nineteen of 162 (73.5%) respondents scored below 70% on the knowledge assessment (mean score 49.3%, SD 26.8). The 12 respondents (7.6%) who reported having received counseling from a pharmacist regarding medication-related fall risk scored significantly higher on the knowledge assessment compared to those who did not (mean score 61.66% versus 48.09%, p = 0.01). Implications: A majority of community-dwelling older adults lacked knowledge of medications associated with an increased risk of falling. However, those who had been counseled by a pharmacist appeared to demonstrate greater awareness of medication-related fall risk. Thus, pharmacist counseling of older adults regarding medications and fall risk should be promoted.

**Baseline Perceptions and Knowledge for a Cohort of Pharmacy Students in an Antimicrobial Stewardship Elective.** Timothy P. Gauthier, Nova Southeastern University, Elizabeth M. Sherman, Nova Southeastern University, Nathan Unger, Nova Southeastern University, Evan Lantz, Jackson Memorial Hospital, Department of Pharmacy, Laura Smith, Jackson Memorial Hospital, Department of Pharmacy, Lilian M. Abbo, University of Miami Miller School of Medicine. Objectives: The University of Illinois at Chicago (UIC) began an interprofessional Rural Health Professions Program (RHP) for pharmacy and medical students. Recruitment of rural pharmacy students has been of particular interest in pharmacy education. The objectives are to describe background characteristics of RHP students and their opinions on rural healthcare and to briefly summarize the components of the RHP program. Method: RHP students for four class years (classes 2014-2017) completed an initial survey that was administered during RHP orientation (prior to starting their first year). The survey collected basic demographics and opinions about rural healthcare and rural healthcare providers. Data were analyzed quantitatively using descriptive statistics. This study was determined exempt by the UIC IRB. Results: All RHP students (n=68) participated in this survey. Nearly 90% of students stated they grew up in a rural area but less than 75% did (strictly defined); 92.8% were Caucasian. All of the students had positive opinions regarding a rural healthcare provider and community involvement. Of the pharmacy students, 80% were unsure if they wanted to complete a residency or not and the majority felt they should be most familiar with rural physicians compared to other health professions. Implications: This study was performed with students from one institution. Results can be used to inform the recruitment of students for other rural education programs. Future studies looking at the personality types of rural students may help demonstrate other outcomes that are important for recruiting the appropriate students into a rural health professions program.
Basic Numeracy Ability of Final-year Pharmacy Students. Piotr J. Jakimczuk, The University of Toledo, Nathanael J. Verlinden, The University of Toledo, Michael J. Peeters, The University of Toledo. Objectives: Prior evidence has illustrated pharmacists’ substantial role in calculating medication dosing and delivery rates in today’s interprofessional environment. However, some experts suspect that pharmacy students’ numeracy (calculations) skills may be declining. Our objectives were to create an instrument, and assess basic numeracy skills among final-year PharmD students. Method: Based on calculations textbooks and our experience, a 20-multiple-choice-question instrument that assessed participants’ basic numeracy skills was created. Additionally, the instrument had demographic and opinion-based questions about numeracy training. In a quasi-experimental design, final-year students and licensed pharmacists (pharmacy residents) took that same instrument and were compared. Results: Twenty-six UT students and 10 residents (primarily non-UT degrees) participated. Reliability of the instrument was 0.7 (students) and 0.63 (residents). Notably, simple proportion questions were easiest to answer, while questions involving calculating creatinine clearance were most challenging. No difference was found between group scores (18.4±1.9 vs 18.3±1.8; t-test: p=0.906); neither gender nor prior degree before PharmD differed (Fisher-exact: p=0.634, p=0.191). As expected, students had studied calculations more in the past 3 months than residents (Mann-Whitney-U: p=0.029). Predictably, those students and residents ‘who felt their calculations-related material was taught well’ were positively-correlated with ‘confidence’ (Spearman: r=0.407; p=0.021) and ‘preparation’ (Spearman: r=0.735; p<0.001) to perform pharmaceutical calculations, while negatively-correlated with ‘amount of time spent reviewing calculations material’ (Spearman: r=-0.404; p=0.022). Implications: In this exploratory study, final-year students’ numeracy skills appeared similar to pharmacists. Right now, our program’s curriculum seems reasonable for basic numeracy. However, due to our small sample size, a further larger-cohort study should be performed to confirm results.

Changes in Health Behaviors of Students in the First Semester of Pharmacy School. Anne Kugler, Western University of Health Sciences, Jonathan H. Watanabe, Emmanuelle Schwartzman, Western University of Health Sciences. Objectives: To identify the impact a pharmacy professional program has on health behaviors of P1 students. Method: P1 students completed surveys at the beginning, mid-point and semester end. Information collected included health behaviors regarding diet, physical activity, sleep habits, alcohol/tobacco use, and stress levels/coping behaviors. Five-point Likert scale findings were collapsed into dichotomous categories: Agree (agree, strongly agree) versus Not Agree (neutral, disagree, strongly disagree). T-tests and Chi-squared tests were used for continuous and categorical variables. Changes in proportional responses were assessed via Trend Test. Association between exercise and stress was evaluated via multiple regression. Results: Surveys were completed by n=99, 113, and 95 students respectively. Respondents were 73.7% female, averaged 25.73 years old, and 137.63 lbs at semester start. From semester start to end, those who ate ≥2 meals/day prepared outside the home increased from 24.24% to 42.11%. A reduction in the percentage of students satisfied with their overall health (54.55% to 22.11%) and with stress management ability (66.67% to 22.11%) was observed. Additionally, there was a reduction in the percentage of students achieving ≥8 hours of sleep per night (41.41% to 3.16%) and eating ≥3 daily servings of vegetables/fruit (43.43% to 16.84%). An increase was seen in percentage of students who agreed they felt stressed most days of the week (21.21% to 76.84%). Students who strongly agreed with this statement reported 80 fewer minutes of exercise/week versus those who strongly disagreed. All differences were statistically significant (p<0.01). Implications: These data highlight areas to target for improving student pharmacists’ health/well-being.
Changes in Students’ Performance and Confidence with a Standardized Patient and Standardized Colleague Interprofessional Activity. Marie L. Davies, University of Pittsburgh, Kristine S. Schoneder, University of Pittsburgh, Susan M. Meyer, University of Pittsburgh, Deanne L. Hall, University of Pittsburgh. Objectives: P3 students are presented with a practice and final patient care interprofessional activity. This includes a standardized patient interaction, SOAP note preparation, and a standardized colleague interaction where students defend recommendations to a physician colleague. The purpose of this study was to assess the impact of a standardized patient and standardized colleague on changes in students’ performance and perceived comfort and confidence in communicating with patients and physicians. Method: Students’ performance was measured by a standard rubric on each section of the practice and final activity. Students were given a pre-survey before the practice activity and a post-survey after the final activity to measure perceived comfort and confidence. Descriptive statistics and paired t-tests were used for statistical analysis. Results: Students performed significantly better from the practice to the final activity on communicating with patients, the SOAP note, and the overall activity with a mean difference (95% CI) of 9.2 (6.86-11.54), 3.56 (1.32-5.80), and 3.85 (2.01-5.69), respectively. There was a significantly positive change from the pre- to post-survey in students’ attitudes towards comfort and confidence in talking to patients and physicians on a majority of the questions. Over 80% of the class felt that this activity strengthened their skills, recommended continuation of this activity, and indicated that interprofessional relationships were important to include in the curriculum. Implications: By emphasizing interprofessional interactions, active learning, and communication, students’ performance improved and their comfort level in communicating and making recommendations was stronger with this activity in the curriculum.

Characteristics of Performance Assessment and Feedback: Variation in Faculty Perception by Duration of Academic Employment. Patrick T. Rocafort, University of Maryland, Andrew Zullo, Brown University School of Public Health, Stuart T. Haines, University of Maryland, Lisa Lebovitz, University of Maryland. Objectives: To assess national patterns of faculty perception of performance assessment and feedback by length of time employed in academia. Method: A standardized survey was administered to faculty at all United States pharmacy schools in 2013. Four items assessed agreement with the statements: 1) performance criteria are explicit and clear, 2) performance criteria are consistent with responsibilities, 3) performance feedback is formal and regularly received, and 4) performance feedback is effective. A two-sample t-test was used to assess differences in agreement between faculty who taught for 0-10 years and those who taught ≥11 years. Results: There were no significant differences for item one between the 0-10 and ≥11 groups for strong agreement [23.7% (95%CI: 18.9-28.5) v. 27.5% (95%CI:18.0-36.9), p=0.19]; agreement [52.8% (95%CI:47.2-58.4) v. 52.7% (95%CI:45.4-60.1), p=0.99]; and disagreement or strong disagreement [20.0% (95%CI:12.8-27.4) v. 17.7% (95%CI:9.0-26.5), p=0.42]. Although fewer faculty in the 0-10 than ≥11 group strongly agreed with items two [22.7% (95%CI: 18.3-27.1) v. 28.0% (95%CI: 21.5-34.4), p=0.04] and three [24.1% (95%CI: 18.5-29.7) v. 28.5% (95%CI: 27.6-29.3), p=0.02], other significant differences were absent. No significant differences for item four were observed. Implications: Substantial differences in perception by duration of academic employment are unlikely, but imprecision of estimates precludes any strong inferences. The assumption that faculty within the 0-10 category are sufficiently similar may be erroneous and important differences may exist between those employed for 0-2, 3-5, and 6-10 years in academia. Future analyses should examine person-level data and finer categories of time to further characterize patterns.

Choose Your Own Adventure: A Reader-Based Plot Selection Method for Patient Case Group Activities. Stephanie L. Hattow, University of Saint Joseph. Objectives: To evaluate the reaction of pharmacy students to a new learning activity involving a reader-based plot selection method (also known as branched-narrative decision-making) mimicking the “Choose-Your-Own-Adventure” format to solve a Parkinson’s disease patient case in the neuropsychomotherapy module. Method: Using the free website http://www.cyocyoa.com, a patient case was presented where two groups of second professional year students chose a therapeutic option (e.g. diagnostic test, medication, verbal response) by clicking a link that directed them to a particular outcome. After completing the activity, students completed a voluntary, five-question survey to evaluate their perceptions, impressions, and overall response to this type of group activity. Survey results were tabulated and evaluated. Results: After two years of activity delivery, 83 surveys were completed. The majority of students were “Very Satisfied” with the activity and 98.7% agreed that they would like to do a similar activity in the future. Most students felt the best part of the activity was receiving instant feedback regarding treatment decisions; the worst was logistically working on the activity in a group setting; and suggested an area for improvement would be increasing the activity’s overall length. Implications: This activity provides a realistic patient situation requiring quick decision-making and direct consequences of actions mimicking clinical practice. A free tool to implement this type of activity into the pharmacy curriculum has not been described previously in the literature. The survey provided information to enhance use of this activity for future course delivery and suggestions for integration into other courses throughout the curriculum.

Cinemeducation: The Innovative use of Hollywood films in Pharmacy Education. Lisa M. Lundquist, Mercer University, Susan W. Miller, Mercer University, Annesha W. Lovett, Mercer University. Objectives: To evaluate students’ perceptions on the usefulness and value of utilizing Hollywood films to reinforce concepts in elective courses. Method: For two consecutive years, Hollywood films were utilized to reinforce concepts in two elective courses, Geriatric Pharmacy and Leadership in Pharmacy. Students enrolled in the courses completed a pre- and post-film 6-question Likert scale survey on the value and usefulness of films with 1 = strongly agree and 4 = strongly disagree. Students also completed a directed reflective assessment. This study was approved by the IRB and students voluntarily signed informed consent prior to participation. Pre- and post-film surveys were compared using descriptive statistics and paired t-tests; qualitative content analysis was used to evaluate directed reflections. Results: A total of 186 (95%) second and third year students completed pre- and post-film surveys. Qualitative analysis of directed reflections revealed the theme “viewing films was a meaningful experience” in each course. Mean scores for pre- and post-film surveys were: films are useful teaching resources (1.77, 1.58); films are useful examples of patient care situations (1.60, 1.46); films are useful examples of professionalism (1.69, 1.54); films have value in teaching course concepts (1.77, 1.57); and the use of film is a valid alternative experience to a lecture (1.89, 1.74) (p<0.05 for all comparisons). Implications: Cinemeducation provides a creative strategy to teach and reinforce course concepts by incorporating Hollywood films to provide a meaningful learning experience.
Clinical Pharmacotherapy Note Writing Across Second to Third-Year Therapeutics Courses: Students’ Perceptions and Performance. Angela O. Shogbon, Mercer University, Kathryn M. Momary, Mercer University, Kendra R. Manigault, Mercer University, Gina J. Ryan, Mercer University, Lisa M. Lundquist, Mercer University. **Objectives:** To evaluate changes in students’ knowledge and perceptions of confidence in patient-based documentation across therapeutics courses from second to third-professional year when utilizing a structured approach, the Subjective Objective Assessment Plan Education (SOAPE) note format. **Method:** Weekly patient-case discussion sessions utilizing the SOAPE note format were incorporated into a Cardiovascular therapeutics course for second-year students in the Spring semester, and subsequently in an Endocrine therapeutics course the following Fall semester during their third-professional year. A pre-test and post-test assessing perceptions of confidence and knowledge in preparation of SOAPE notes were administered at the beginning and end of each course. Perception of confidence was ranked on a 4-point Likert scale (1=strongly disagree, 4=strongly agree). IRB approval and informed consent were obtained. Scores on the pre-tests and post-tests were compared utilizing descriptive statistics and paired t-tests. **Results:** A total of 99(75.6%) students completed both the pre-test and post-test in both courses. There was significant improvement in students’ perception of confidence in writing SOAPE notes on the pre-tests, from their second-year to third-year with mean(SD) scores of 2.50(0.42) vs. 3.41(0.39) respectively, p<0.001. Students’ mean(SD) performance on the knowledge section of the pre-test significantly increased from their second-year, 81.1%(20.9), to third-year, 96.8% (7.9), p<0.001. There was no significant difference in students’ level of confidence or performance on the post-tests in their second-year compared to third-year. **Implications:** A structured and consistent approach to patient-based documentation across therapeutic courses may reinforce students’ learning and improve their knowledge and confidence to perform this task on experiential rotations and in clinical practice.

Closed Facebook Question Group as an Alternative to Blackboard Discussion Forum in a Required Course. Amee Mistry, MCPHS University - Boston, Dhiren K. Patel, MCPHS University - Boston, Lana Dvorkin-Camiel, MCPHS University - Boston, David Schnee, MCPHS University - Boston, Kathy Zaiken, MCPHS University - Boston, Catherine Taglieri, MCPHS University - Boston, Stefanie C. Nigro, MCPHS University - Boston, Susan Jacobson, MCPHS University - Boston, R. Rebecca Couris, MCPHS University - Boston, Jennifer Goldman-Levine, MCPHS University - Boston. **Objectives:** To evaluate PY3 students’ preference of using a closed Facebook question group for discussions compared to traditional Blackboard discussion forums in a large Over-the-counter/self-care course. **Method:** Students were invited to join a closed Facebook Question group as a means of posting questions and comments outside of class. Students were informed about the benefits of participating in a closed Facebook group (e.g., content available only to group members.) At the end of the course, students were anonymously surveyed about their preference for a closed Facebook Question group versus Blackboard discussion. **Results:** Of the 305 students enrolled in the course, 286 responded to survey with 71% being enrolled in Facebook Question group. Of 202 students enrolled many strongly agreed/agreed appreciating the opportunity to use a closed Facebook Question group (59%), finding it to be a better way to communicate than using Blackboard discussion forums (60%), accessing the group often and reading most of the posts (59%), “favoriting” Facebook group to monitor discussions better (46%). Only 18% preferred to use a different method of asking questions out of class (with email and Blackboard being most frequent alternatives.) **Implications:** Faculty previously experimented with various ways of posting responses to questions via Blackboard discussion forums with only minority participating. Faculty were hopeful to engage greater number of students in discussions via Facebook. Even though, many preferred using a closed Facebook Question group for communication in comparison to Blackboard discussion forums, exchanges were still limited.

Collaborative Implementation of P1 and P2 Comprehensive Benchmarking Examinations by Three PharmD Programs. Erik Borg, Pacific University Oregon, Donna M. Adkins, Appalachian College of Pharmacy, Reza Karimi, Pacific University Oregon, Charles R. Breese, Appalachian College of Pharmacy, James L. Junker, University of Maryland Eastern Shore. **Objectives:** To administer comprehensive first year (P1) Pharmaceutical Science and second year (P2) Clinical Science examinations among three PharmD programs in order to benchmark student learning between schools with similar accelerated three year block curricula. **Method:** Benchmarking examination questions were generated by faculty from three PharmD programs. Exam content was weighted to approximately represent the credit and content hours of each program’s curriculum. Each comprehensive examination was composed of 100 multiple choice questions and students were allowed two hours to complete the examination. Students were provided feedback on the subject areas in which they did not receive full credit and a student survey was used to assess student perceptions about the efficacy of the examination and their performance. **Results:** Examination results have provided data to benchmark student learning. The mean scores for the P1 and P2 examinations for the 2012-13 academic year were 63.0% and 59.9% respectively (P1 n = 223; P2 n = 228). Summed student survey assessment data (P1 n = 110; P2 n = 140) reported that the benchmarking examinations assisted P1 (91.8%) and P2 (84.3%) students in identifying curricular areas needing improvement, assisted P1 (89.1%) and P2 (85.8%) students in identifying curricular strengths, and assessed knowledge retention from the P1 (93.6%) and P2 (74.3%) curricula. **Implications:** Implementation of collaborative comprehensive examinations can assist to benchmark student performance between PharmD programs with similar curricula and aid students in identifying strengths and areas for improvement.

Communicating the Value of the Pharmacist—An Educational Foundation for Doctor of Pharmacy Students. Celia P. MacDonnell, The University of Rhode Island, Saumitra V. Rege, The University of Rhode Island. **Objectives:** This project is aimed at evaluating pharmacists’ attitudes about their value as future health care providers. **Method:** A laboratory workshop was conducted with P3 pharmacy students using three patient/pharmacist encounter scenarios, common to community pharmacy practice. Video vignettes discussed: 1) medication adherence; 2) prescription wait times, and 3) medication costs. Students were surveyed pre and post-workshop and asked how they believe patients perceive the pharmacist’s value. They were also asked how they see their own value to the patients they serve. **Results:** The majority (63.02%) of the students believed that the patients that they serve believe that clinical accuracy/accurate medication information (37.39%) and customer service (25.63%) are of the greatest value. The students themselves (59.24%) consider clinical accuracy/ drug information their most valuable service to their customers. Cost and insurance questions by the patients, to the pharmacists were seen as the most frustrating (50.53%). Overwhelmingly (85.5%) the students responded that they learned/gained at least one new way of demonstrating the value that is provided by pharmacists.

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Implications: As a result of the workshop, P3 students indicated that they felt more confident in addressing the most frustrating questions received from patients/customers and indicated they felt more comfortable shifting the discussion to value.

Community Pharmacists and Alzheimer’s Disease Pharmaceutical Care in Chicago. Marketa Marvanova, Chicago State University, Paul J. Henkel, Deborah Ondimu, Hany Meskelu. Objectives: Our study examines the ability of community pharmacists to provide quality care to elderly persons with Alzheimer’s disease (AD) or dementia, a growing, high need population. Method: We identified and selected community pharmacies (N=157) in Chicago, Illinois. A survey instrument was developed and administered (N=143) including items on AD expertise, medications, self-care and continuing education (CE). Data were analyzed using Stata 10.1. Results: Self-rated expertise in providing AD care was 5.8/10. Only 69.5 percent of pharmacists identified there was “no cure” for AD while 17.2 percent recommended medication(s) to reverse the disease course. Most were unable to name common side effects of donepezil including nausea-vomiting-diarrea (NVD) (22.1%) and fatigue (18.4%), and none mentioned cardiovascular side effects such as bradycardia or syncope. Pharm.D.-trained pharmacists were more likely to identify NVD (OR=3.07, 95%CI=0.94-9.98) but less likely to identify Fatigue (OR=0.43, 95%CI=0.16-1.13) compared to B.S.-trained pharmacists. Most pharmacists (74.5%) made inappropriate recommendations for an OTC sleep aid for a dementia patient currently using the rivastigmine patch. The majority of pharmacists (65.4%) had completed no CE hours in AD in the past 12 months. Only 8.8 percent completed more than two hours. B.S.-trained pharmacists were more likely to have completed CE in AD compared to Pharm.D.-trained (OR=1.95, 95%CI=0.94-4.03). Implications: AD is a serious problem in the US, and our study seems to indicate that community pharmacists need high-quality continuing education on AD and dementia, medications for AD and dementia care, and self-care for persons with AD and dementia.

Comparing Understandability and Actionability of English and Spanish Patient Hypertension Handouts Utilizing the AHRQ PEMAT. Enas E. Ibrahim, The University of Texas at Austin / University of Texas - Pan American, Cooperative Pharmacy Program, Robert B. Perez, The University of Texas at Austin / University of Texas - Pan American, Cooperative Pharmacy Program, Adrian Sandoval, Saenz Medical Pharmacy, Yasar Tasnif, The University of Texas at Austin / University of Texas - Pan American, Cooperative Pharmacy Program. Objectives: To explore student confidence levels and their evolving perceptions regarding self-directed and life-long learning. Further scholarship might explore student confidence levels and their evolving perceptions regarding self-directed and life-long learning.

Comparison of Teaching Methods on Skin Disorders: Standardized Patients Dressed in Moulage Versus Paper Cases. Rick Hess, East Tennessee State University, Emily K. Flores, East Tennessee State University. Objectives: To determine whether using Standardized Patients (SPs) dressed in moulage improves students’ ability to identify and assess skin disorders compared to using paper cases; to determine student preferences between active learning methods. Method: Patient Assessment is a P3 course involving lecture and determine student preferences between active learning methods. Further scholarship might explore student confidence levels and their evolving perceptions regarding self-directed and life-long learning.

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to apply the material to the community pharmacy setting when utilizing SPs dressed in moulage versus paper cases must be weighed in planning future experiences as the educational impact may not be great.

Comparison of Outcomes Arising from Multidisciplinary, Interprofessional Education Events Occurring in the First Professional Year. Brittany L. Riley, Marshall University, H. Glenn Anderson, Marshall University, Kimberly A. Broedel-Zaugg, Marshall University, Lisa W. Frazier, Angel Kimble, Marshall University, Hassan Koc, Marshall University, Robert B. Stanton, Marshall University. Objectives: This study aimed to determine improvement in interprofessional awareness after a series of interprofessional education (IPE) events that involved pharmacy students in the first professional year. Another aim was to identify significant deficits in interprofessional awareness among the program participants. Method: The IPE events are a set of three events held in the first professional year. Students from all of the health disciplines within our school attend these events, with a main objective being to describe the unique roles of all health professionals comprising an interprofessional team. The students are asked to complete a pretest and posttest that assesses knowledge of licensing and scope of practices for each profession. The test results were evaluated for improvements in interprofessional awareness as a result of attending these events. Results: A total of 288 students completed the pretest and 154 students completed the posttest. Pretest (34.3 vs. 32.8, p = 0.008) and posttest scores (35.7 vs. 33.0, p = 0.017) were lower for pharmacy students. Pretest-posttest changes in student scores were similar between student groups (p-value = 0.171). Implications: Improvements in interprofessional awareness following participation in the IPE events were not observed. Poor outcomes may be an effect of restrictions in extracurricular student interaction and student effort when completing posttests. Future efforts will be made to encourage interprofessional engagement outside the curriculum and emphasize posttest importance.

Comparison of Student Self-assessment Versus Faculty Assessment of Communication and Teamwork for an Interprofessional Simulation. Katie E. Ronald, Southern Illinois University Edwardsville, Miranda J. Wilhelm, Southern Illinois University Edwardsville, Gloria Brunner, St. John’s College. Objectives: To compare student and faculty perceptions of interprofessional communication and teamwork during a high-fidelity simulation. Method: Three institutions collaborated to develop a two-day, required interdisciplinary experience for student pharmacists, nurses and respiratory therapists. Students were divided into 16 teams of 6-9 students and rotated through (1) small group Jeopardy game; (2) high-fidelity simulation and debriefing; and (3) practitioner panel discussing collaborative practice roles. Sixteen item data collection tool was designed to assess perceptions of interprofessional communication and teamwork skills utilizing a 7-point Likert scale (1= completely disagree to 7= completely agree). One faculty member from both the pharmacy and nursing schools completed the assessment in real-time while the students completed the assessment upon completion of the simulation. Results: Seventy-four pharmacy students, forty-three nursing students, nine respiratory therapy students and six faculty members participated in the assessment. Overall, students self-assessed themselves favorably with regards to interprofessional teamwork and communication during the simulation while faculty members rated the students less favorably. For all 16 items on the assessment, there was a statistically significant difference (p<0.001) in student and faculty perception of teamwork and communication during the simulation. A 2-way ANOVA revealed profession was not a significant factor on the results. Implications: Students and faculty have differing perceptions of teamwork and communication during an interprofessional simulation. Possible factors for differences may include experience with interprofessional teamwork and communication as well as expectations. Future investigation to discern differences in assessment could include real-time peer assessment and video-taped self-assessment.

Content Mapping in a Therapeutics Course Based on the Delivered Curriculum: The Slides Don’t Lie. Matthew M. Lacroix, University of New England, Emily K. Dornblaser, University of New England. Objectives: To evaluate the amount of time spent in an 8-credit therapeutics course on pre-defined curricular content areas. Method: Student feedback regarding the Fall 2013 Therapeutics II course included concerns that lecture time was spent on content areas outside the class focus. At the completion of the Fall 2013 semester all instructors in the Therapeutics II course submitted complete slide sets for students to Blackboard. All slides for each lecture were categorized by topic area including: pathophysiology, pharmacology, epidemiology, guideline review, primary literature review, case study and other. Title slides, objective slides and transitional slides were excluded from the total. The total time for each lecture section was divided by the number of slides for that lecture to evaluate time spent per slide Results: There were a total of 3600 total didactic minutes within the fall semester. Pathophysiology accounted for 28% of lecture time, followed by pharmacology (25%), guideline/therapeutics (21%), specific literature review (6%) and epidemiology (3%). Active learning accounted for 17% of lecture time. Implications: The time spent in each area is appropriate for this course based on its placement in the overall curriculum. An additional 750 minutes of active learning in the form of a case study recitation represents a significant amount of non-didactic lecture time focused on guidelines/therapeutics and pharmacology. Future evaluates will compare mapped lecture content areas to summative assessment content areas to evaluate congruence of the delivered and assessed curriculum.

Demographics and Outcomes Associated with a Multidisciplinary MOOC Diabetes Course. Lisa Kroon, University of California, San Francisco, Steven Williams, University of California, San Francisco, B. Joseph Guglielmo, University of California, San Francisco. Objectives: To summarize the epidemiology and associated outcomes associated with a multidisciplinary MOOC course Method: We developed a multidisciplinary massive open online course (MOOC) outlining the diagnosis, treatment, and future directions regarding diabetes. With primary oversight by the School of Pharmacy (SOP), instructional sections were created in the diagnosis, treatment plans, pharmacotherapy, self-management, dental health and future research directions. In addition to the SOP, faculty from the schools of dentistry, medicine, and nursing were responsible for instruction and assessment in this 5-week course. Results: A total of 26,213 participants enrolled in the course, however, only 1633 (5.2%) completed all assessments. 1367 (83.7%) passed the course with a grade of ≥70%. While the largest percentage was from the US (29%) participation was worldwide: India 7%, Spain 4%, UK 4%, Mexico 3%, Brazil 3%, Australia 3%, Greece 3%, China 2%, Pakistan 2%, 55% did not speak English as a first language, and 59% had never taken a course regarding diabetes. The highest level of completed education was: < High school 1%, High school/GED: 6%, Some college: 9%, 2 yr college degree: 6%, 4 yr college degree: 32%, Masters: 25%, Nonprofessional doctoral degree: 5%, Professional degree (MD, PharmD, etc): 15%. The primary
stated reason for course participation was health professional wanting development of professional skills. 95% stated the course was of high quality, and 93% felt more confident in their ability to interpret data regarding diabetes. **Implications:** A multidisciplinary disease-centered MOOC can be of high quality and benefit large numbers of students.

**Design and Implementation of a Competency Based Self-Care Course.** Cassandra Beyerle, Sullivan University, Misty M. Stutz, Sullivan University. **Objectives:** To design a self-care course that was taught following the guidelines of competency based education as defined by the college of pharmacy, compare overall knowledge of students to previous traditional taught self-care courses and identify barriers to successful implementation of competency based education. **Method:** As part of a pilot program to introduce competency based education to the curriculum, first year students enrolled in the self-care course were to be taught with competency based methodology. The course was split up into 10 areas of study grouped by topic. Students were required to successfully complete all 10 areas at an 85% competency level for successful completion of the course. In the event a student was unsuccessful at scoring an 85%, they were allowed to retake the competency during weekly retake sessions. Maximum obtained grade was capped based upon retake number. The final exam was a comprehensive multiple choice exam that was comparable to previous years to allow a comparison of scores. A score of 69.5% was required to pass the final exam. **Results:** 95% of the class passed the final exam with a class average of 86%. This average was 5% higher than previous years with an average of 80.9% in 2011 and 81.4% in 2012. **Implications:** Delivering a self-care course using competency based techniques is successful with limitations. The coordinators of this course will continue to use aspects of this teaching methodology but will revisit the 85% competency threshold, number of assessments given and number of retakes allowed.

**Determining the Need for a Rapid Diagnostic Testing (RDT) Elective.** Allison M. Dering-Anderson, University of Nebraska Medical Center, Donald G. Klepser, University of Nebraska Medical Center, Michael E. Klepser, Ferris State University, Keith M. Olsen, University of Nebraska Medical Center. **Objectives:** Identify learning objectives for an RDT elective. Compare the RDT elective objectives with the RDT-related content in existing course offerings to determine the need for a stand-alone course on content was being delivered elsewhere in the existing curriculum. **Method:** A consortium of faculty and practitioners developed an RDT certificate program for community pharmacists. Curricula from two Colleges of Pharmacy (University of Nebraska and Ferris State) were examined to determine if objectives from the RDT certificate program were fulfilled. **Results:** Objectives related to areas such as physical assessment, triage, selection of antimicrobials for treatment of various infectious diseases, blood borne pathogens, and management of hazardous waste were met or partially met in existing courses. Objectives related to the understanding of the use, limitations, and interpretation of RDTs were not fulfilled. Additionally, no content on the development and maintenance of RDT supported disease management programs (e.g., program management/justification, work flow, documentation, Clinical Laboratory Improvement Amendments, and collaborative practice) was identified. **Implications:** Organized, stand-alone courses on RDTs are lacking from curricula at most Colleges and Schools of Pharmacy. Discussions with faculty and thought leaders across the country revealed an interest in developing a course on RDTs and the regulations and business models supporting their use. An RDT elective course was developed by incorporating objectives and outcomes from the RDT certification program. Upon completion of the elective, students fulfill requirements for certification. This is similar to the model by which the APHA Immunization Course has been incorporated into many curricula.

**Development and Implementation of an Elective Course Titled “Pharmacy Management of Vulnerable and Underserved Populations.”** Kamala M. Nola, Lipscomb University. **Objectives:** The purpose of this elective is to improve the student pharmacist understanding of the role of the pharmacist on the inter-professional healthcare team in providing care for vulnerable and underserved patients. The elective focuses on principles, practice, and populations. **Method:** Students enrolled in the course are surveyed to identify populations of interest prior to the start of the school year. The syllabus is designed with these populations of interest in mind. Active learning, site visits, service learning, and special guest speakers make the course dynamic in nature. Guest speakers include physicians, pharmacists, nurses, social workers, community advocates, and patients. Students are tested over concepts such as health literacy, motivational interviewing, cultural competency, safety-net access, advocacy, and population-based disease-specific issues. **Results:** Populations of interest to student pharmacists include the homeless, immigrants, elderly, the mentally ill, substance abusers, HIV/AIDS, women, families, adolescents and children. A required project called “Adopt-A-Community” gives the student additional hands-on experience in working with diverse populations. Through this required project students are given the opportunity to practices the knowledge and skills learned in the classroom. A goal of the project is to create connections between the community and pharmacists in which interactions are mutually beneficial. **Implications:** As a result of this course students visit diverse neighborhoods to learn first hand from community partners about core health concerns in ways they would not normally be able see while on advanced pharmacy practice experiences or in their required course work.

**Development and Outcomes of an Elective Course to Prepare Pharmacy Students for Postgraduate Education.** Mark S. Johnson, Shenandoah University, Jamie R. Klucke, Shenandoah University, Amber W. Wester, Shenandoah University. **Objectives:** To develop a course to educate pharmacy students about postgraduate education opportunities, prepare them for the application process, and assess student knowledge and confidence. **Method:** This course was designed to increase pharmacy student awareness of postgraduate training opportunities and prepare them for the application process. The course consisted of series of lectures, discussions, interactive activities, and assignments to develop the professional skills necessary to prepare for application to various postgraduate programs. Students were taught how to develop a curriculum vitae and letter of intent, how to prepare for residency showcases, the ASHP Match, and onsite interviews, and how to apply through PhORCAS. Students also participated in a series of mock interviews and practiced presentation skills. Students were surveyed before and after the course via a survey hosted on Survey Monkey using a five point Likert scale to determine their knowledge of postgraduate training, based on course objectives and activities, and confidence in the postgraduate application process. **Results:** Thirteen students completed the 1.5h elective course in the Fall 2013 semester. All student responses increased after completion of the course, demonstrating increased knowledge of postgraduate training and confidence in their skills. **Implications:** An elective course to prepare pharmacy students for postgraduate education opportunities was successful in increasing student knowledge and confidence in the postgraduate education process. As the competitive nature of postgraduate training opportunities increases, courses designed to further enhance students’ knowledge and confidence in the postgraduate education process are needed.
Development and Evaluation of Cardiovascular-focused Educational Program Taught Collaboratively by a Pharmacist and Dietitian. Deanna Tran, University of Maryland, Lisa Coleman, Giant Pharmacy, Henry Lederer, University of Maryland, Bethany Miller, University of Maryland, Monet Stanford, University of Maryland, Cherokee Layson-Wolf, University of Maryland. Objectives: To develop and evaluate a patient-centered cardiovascular-focused educational program taught collaboratively by a pharmacist and registered dietitian in a grocery store chain. Method: Patients participated in a three-week long educational program with two integrated and interactive 1.5 hour sessions focused on hypertension management at a grocery store chain. The program expanded on Team Up Pressure Down (TUPD) by incorporating a registered dietitian. The program reviewed the DASH diet, importance of exercise, daily monitoring of blood pressure, and hypertensive medications. It was offered for 6 months. A pre- and post-program questionnaire was distributed to evaluate changes to lifestyle habits and knowledge of hypertension management. Results: Twenty-four patients participated in the first session, and seventeen patients participated in both sessions of the program. Prior to the program, 19% of patients self-reported exercising more than three times a week, 23% reported checking their blood pressure at least once a week, and 0% answered all five knowledge-based questions correctly on the questionnaire. Of the seventeen patients who completed both sessions of the program, 41% self-reported exercising more than three times a week, 43% reported checking their blood pressure at least once a week, and 47% answered all five knowledge-based questions. Implications: This small pilot practice model supports the value of providing interdisciplinary cardiovascular-focused educational programs in the community. This program demonstrated improved knowledge of hypertension and encouraged healthier lifestyle habits. This is the first study to date involving community-based pharmacists and registered dietitians teaching an educational program in a grocery store setting.

Development of a Faculty Development and Mentoring Program in a Large Pharmacy Practice Department. Janet P. Engle, University of Illinois at Chicago. Objectives: There were no formal faculty development, mentoring or orientation programs in the Department. A large number of clinical faculty were still at the assistant professor level after numerous years of service. The department developed a faculty development and mentoring program designed to guide faculty in achieving excellence in their teaching, service and scholarly activities to successfully attain promotion in academic rank. Method: A program was put into place whereby new faculty are mandated to participate in the mentoring and orientation program and seasoned faculty were given the option. Mentoring progress forms were developed to assist the mentor in keeping track of mentoring sessions and mentee’s progress. These are shared with the department head annually. The mentors and mentees can also meet with the department head to share results. Faculty development programming is optional but many faculty avail themselves of the opportunity. Results: Sixty faculty are involved in the mentoring program as a mentor or mentee. Most clinical faculty participate in the faculty development sessions. Since the program’s debut in 2008, 14 clinical faculty have successfully achieved promotion to clinical associate professor or clinical professor. This is in contrast to the previous 5 years when only 2 faculty achieved successful promotion. Faculty have indicated that the mentoring program is extremely useful. Implications: The program continues to grow with additional faculty requesting participation. Mentees report having a clear plan to follow for promotion. The mentoring, orientation and faculty development programs are reviewed on an annual basis to allow for improvements and suggestions.

Development of a Pharmacy Faculty Manual to Facilitate Mentoring, Teaching, Research, and Service. Annessha W. Lovett, Mercer University, Renee L. Hayslett, Mercer University, Lisa M. Lundquist, Mercer University, Kendra R. Manigault, Mercer University. Objectives: To provide a resource document in the creation of a pharmacy faculty manual and to assess the usefulness of the manual. Method: Best practices in the literature were utilized to develop the pharmacy faculty manual. Upon dissemination of the manual, an anonymous 10-item survey was emailed to all pharmacy faculty members to obtain feedback on usefulness utilizing a Likert scale (1=strongly agree, 4=strongly disagree). Data analysis involved descriptive and inferential statistics. This study was approved by the University’s Institutional Review Board. Results: The manual comprised 108 pages covering 24 topics (e.g. promotion and tenure, mentoring tips). Seventy-five percent (n=24) of the faculty responded to the survey; 74% female, 48% Caucasian, 33% African American, 19% Asian, 87% Assistant/Associate Professor, 62% pharmacy practice, 52% tenure track. Eighty percent agreed or strongly agreed that the manual was useful in the areas of mentoring, teaching, research, and service. The majority of faculty agreed or strongly agreed on the importance to include faculty feedback (100%, mean 1.47), the manual being a comprehensive source (95%, mean 1.6), and the manual being assessed yearly (80%, mean 1.6) (p<.05). A suggestion was to develop a repository of faculty concerns that can be viewed by all at any time. Implications: The ability to quickly update and disseminate information via a manual enables the college to meet changing faculty needs. Although it is impossible to address every aspect of mentoring, teaching, research, and service, developing the most comprehensive manual possible will provide a consistent, streamlined approach for addressing the complexity of faculty responsibilities.

Development of the Five P’s of Pharmacy Assessment Tool. Michael Gonyeau, Northeastern University, Paresh Kumar, Northeastern University. Objectives: The five Ps of pharmacy assessment tool was designed to guide students through analysis/assessment component of the SOAP process. It consists of: Patient, Prescription, Pharmacokinetics, [drug related] Problems, and Prevention. Our objective was to this tool through structured feedback from practicing pharmacists and pharmacy faculty. Method: A voluntary, anonymous, continuous quality improvement study was distributed to all practicing pharmacists in Massachusetts and institutional pharmacy practice faculty consisting of a seven-item questionnaire and the assessment tool. Pharmacist items consisted of demographics, work/preceptor experience and potential application of the tool for themselves and students in their practice environment. Faculty items related to practice site, educational experience, and application to pharmacy students. Each concluded with open responses related to perceived strengths and areas for improvement. Results: One hundred sixty-three respondents completed the survey (149 (4%) Massachusetts pharmacists (MP) and 12 (45%) faculty (F)). Fifty-two percent agreed the tool would be helpful to practice, while 85.8% agreed tool would aid in the teaching/learning of the SOAPing process and should be easy to learn (MP=92%, F=71%). Most respondents agreed the tool would improve student competence(62.5%), confidence(87.5%) and efficiency(62.5%). Comments highlighted concise algorithmic structure, easy to remember mnemonic, and potential for implementation in practice and didactic/clinical teaching. Suggestions included wording modifications, efficiency improvements, tool integration, and time commitment necessary. Implications: Respondents supported the 5Ps of pharmacy assessment tool as an adjunct to the assessment portion of the SOAPing
Drug Distribution in Rural Western Kenya: Logistics and Challenges to Program Implementation. Elizabeth G. O’Hara, Purdue University, Jemima Kamano, Moi Teaching and Referral Hospital, Imran Manji, Moi Teaching and Referral Hospital, Eldoret, Kenya, Monica L. Miller, Purdue University, Ellen M. Schellhase, Purdue University. Objectives: The Academic Model Providing Access to Healthcare (AMPATH) is utilizing its extensive infrastructure for HIV care to address the growing burden of non-communicable diseases (NCDs). AMPATH utilizes all levels of the health care system, from the home to the hospital, with the goal of delivering comprehensive care to western Kenya. The objective is to describe the implementation of a pilot program providing pharmaceutical supply chain management to dispensaries (rural primary care clinics) in western Kenya. Method: By 2013, 32 dispensaries have partnered with AMPATH’s Chronic Disease Management (CDM) department to provide clinical care and medication to patients with hypertension and/or diabetes. CDM supports dispensaries with training, protocols, diagnostic machines, and medications. Monthly mentorship visits are made to remote locations to resupply medications and provide clinical care support. Through feedback from site visits, CDM identified challenges with medication supply management and worked with a pharmacist to determine areas for improvement. Results: Challenges included lack of a formal stock management program to monitor the flow of medications and track pricing and revenue collection. Dispensaries also struggled to maintain stock and respond to emergent patient needs. Implications: CDM has provided access to chronic disease care to over 1000 rural Kenyans in the last year with pharmacy partnership as a vital component to the development of access to chronic disease care to over 1000 rural Kenyans in the last year with pharmacy partnership as a vital component to the development of.

Drug Interactions and Adverse Events from Energy Drinks Consumption. Andi L. Corya, Paige E. Devine, Purdue University, Janet R. Thorlton, Purdue University, David A. Colby, Purdue University. Objectives: The objective of this research was to identify potential drug interactions that arise from the consumption of energy drinks due to the increasing incidence of adverse events from patients using these caffeine-rich beverages. Method: We compiled a list of all of the active ingredients in the many common energy drinks and examined the known mechanisms of action as well as drug interactions in the literature. We have studied the metabolism of caffeine using liver microsomes in the presence of these individual ingredients. Additionally, we have reviewed data from the Drug Abuse Warning Network for energy drink-related visits to U.S. emergency departments to define which drugs were taken concomitantly with energy drinks and resulted in a high risk interaction. Results: Many potential drug interactions were discovered through these processes and a comprehensive list was compiled as an educational tool for healthcare providers and patients. For example, the metabolism of caffeine is through the CYP1A2 enzyme which is inhibited and induced by many pharmaceuticals. These effects are further exacerbated by the other components in energy drinks that also affect these enzymes. Implications: The consumption of energy drinks is at an all-time high with expected sales of $52 billion by 2016. Ingredients in energy drinks, such as caffeine, guanine, and ginseng, are known to interact with the CYP450 enzymes which are major contributors to many adverse drug interactions. We have developed an education tool that describes the clinical implications of energy drink consumption to patients and health care providers.

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Dual-Purpose Accreditation Workshop: Enhancing Knowledge While Fostering Active Learning. Jane R. Mort, South Dakota State University, Teresa M. Seefeldt, South Dakota State University. Objectives: Utilize a self-study workshop to increase knowledge of the accreditation process/college’s self-study and foster plans to employ active learning strategies. Method: Following completion of the college’s first self-study draft, a one-day workshop was provided for faculty, staff, students, and stakeholders. The workshop was facilitated by an outside expert and included an interactive poster session, team based learning, accreditation visit simulation, group discussions, and a presentation. Assessments included pre-test, post-test, and active learning strategy survey. Results: Faculty (28), staff, students, and stakeholders (8) participated in the workshop and completed all components of the assessments (34). Knowledge increased significantly (57.6% pretest, 68.2% posttest, p<0.001), specifically in the area of accreditation knowledge (48.2% pre, 63.5% post, p=0.004). Data suggested a trend of increased knowledge regarding the College’s self-study (61.8% pre, 65.7% post, p=0.16) and active learning practices (77.9% pre, 83.8% post, p=0.32). New active learning strategies were planned by 22 faculty (81.5%) with team based learning and classroom polling selected most often. Twelve faculty anticipated employing two or more new active learning approaches. Regarding challenges to implementation, 23 (85.2%) faculty reported two or more challenges and the most frequently reported challenge was “time for creative efforts” followed by “limited class time.” Implications: The self-study process is a critical quality improvement practice that requires active participation by faculty, staff, students, and stakeholders despite significant time constraints. Data indicates this dual-purpose workshop increased knowledge of the accreditation process/college’s self-study and fostered active learning plans.

Duplicating a Well-controlled Stability Research Study in a Teaching Compounding Laboratory. Melissa M. Dinkins, University of North Carolina at Chapel Hill, Robert P. Shrewsbury, University of North Carolina at Chapel Hill. Objectives: A published research study demonstrated the stability of compounded zonisamide suspensions. The teaching laboratory experience was to provide students an opportunity to determine the stability of their compounded suspensions using the research protocol. The objective was to determine if the student results could replicate the research result, and if student results were different, identify possible explanations for the difference. Method: Zonisamide suspensions were compounded by second-year pharmacy students in either simple syrup or 0.5% methylcellullose and stored at either room or refrigerated temperature (the PCL study). Students drew samples over a 28 day period, and observed their preparations for color, odor, and the presence of bacteria. The samples were analyzed by HPLC, and the results reported back to the students who compared their results with the published research study. Results: The PCL study showed average zonisamide concentrations statistically below those of the research study throughout the 28-day period, regardless of the vehicle or storage condition. The PCL study has been conducted over a period of 4 years, and comparable results were seen each year. Implications: The results suggest that a scale-up of a research study to a teaching laboratory experience is not straightforward. Differences can arise from methylcellullose grade used, multiple samplers, number of samples taken by students, number of samples in each matrix component, and sample collection from satellite campuses.

Effect of Collaborative versus Non-collaborative Quiz Administration on Exam Scores in a Pharmaceutical Care Course. Stephanie Enz, Butler University, Donald R. Frosch, Butler University. Objectives: To determine if mean scores on individually taken midterm and
final exams in a pharmaceutical care laboratory course differ between those who take weekly quizzes by working: 1) collaboratively in small groups, 2) non-collaboratively, or 3) collaboratively for half the semester and non-collaboratively for the other half (“mixed”).

**Method:** Subjects self-enrolled in one of four lab sections: Lab-A (collaborative), Lab-B (non-collaborative), Lab-C (half non-collaborative, then half-collaborative), or Lab-D (half-collaborative, then half non-collaborative). Labs C and D were statistically combined to form a counterbalanced “mixed” group. When enrolling, subjects were unaware of lab section differences. Subjects assigned to work non-collaboratively individually completed a 15-minute quiz at the end of each weekly lab. Subjects assigned to work collaboratively were randomly allocated into groups of 4-6 students, and worked independently on each quiz for 10 minutes before working collaboratively for 5 minutes. All subjects took the midterm and final exam independently.

**Results:** Mean scores for a pretest didn’t differ among the three groups at the study’s onset \[F(2,120) = 1.470, \text{MSE} = 3.178, p = .234\]. Mean scores for the midterm exam significantly differed among comparison groups \[F(2,120) = 3.350, \text{MSE} = 7.820, p = .038\], as did mean scores for the final exam \[F(2,66.242) = 7.763, \text{MSE} = 9.778, p = .001\]. The mixed group outperformed the non-collaborative and collaborative groups on both exams, but only differences between the mixed and collaborative groups were significant.

**Implications:** Half-collaborative/half-non-collaborative quiz administration is more beneficial than collaborative-only quiz administration in a pharmaceutical care course.

**Effect of Delirium Motoric Subtypes on the Documentation of Delirium in the Intensive Care Unit.** Lan N. Bui, Vy Pham, Joshua T. Swan, Texas Southern University. **Objectives:** International Classification of Diseases, Ninth Revision (ICD9) codes have been used to estimate prevalence of comorbidities in hospitalized patients. However, our previous study demonstrated that ICD9 codes have a low sensitivity (53%) in detecting delirium prevalence in the surgical Intensive Care Unit (ICU) when compared to the Confusion Assessment Method for Intensive Care Unit (CAM-ICU) as the standard reference.

**Method:** This retrospective cohort study included all adult patients admitted to the surgical ICU from 06/01/2012 through 05/31/2013. Patients admitted to another ICU during the same hospital admission and those who were not screened with the CAM-ICU were excluded. Delirium was defined as at least one CAM-ICU positive rating. The proportion of patients who received documentation of delirium using ICD9 codes compared to patients with hyperactive subtype. **Method:** This retrospective study included 368 patients admitted to the medical ICU from 06/01/2012 through 05/31/2013. Patients admitted to another ICU during the same hospital admission and those who were not screened with the CAM-ICU were excluded. Delirium was defined as at least one CAM-ICU positive rating.

**Results:** Of 1,187 patients included in the cohort, 40% (484 patients) were diagnosed with delirium using the CAM-ICU. The proportion with ICD9 documentation of delirium was 67% (180 of 287 patients) for hyperactive and mixed motoric subtypes versus 33% (88 of 269 patients) for hypoactive motoric subtypes (relative risk = 2.03, \(p < .001\)). Patients with hypoactive delirium were significantly less likely to receive documentation of delirium using ICD9 codes compared to patients with hyperactive or mixed delirium.

**Effect of Item Writing Flaws on the Performance of Multiple Choice Questions: A Pilot Study.** Gwendolyn Wantuch, University of South Florida, Kamila A. Dell, University of South Florida. **Objectives:** Evaluate the impact of item writing flaws (IWF) on the performance of multiple choice questions (MCQ) in a pharmacotherapeutics course. **Method:** Evaluation of MCQ for the presence of IWFs was previously completed. The performance of the questions with IWF was compared to those without flaws through evaluation of the difficulty level and the point biserial coefficient. Descriptive statistics were performed on collected data. Two-tailed t-tests were utilized to compare the difficulty level and the point biserial coefficients of the flawed and non-flawed items. **Results:** A total of 238 questions were analyzed. Of these, 196 contained at least one IWF. While the average difficulty level of questions with IWF was less than those without IWF, 0.64 and 0.69 respectively, the results were not statistically significant (\(p = 0.17\)). However, the point biserial coefficient was 0.19 for questions with IWF and 0.25 for questions without IWF. This finding was statistically significant (\(p = 0.027\)). **Implications:** Questions with IWFs performed worse on examinations, as evidenced by the difference in point biserial coefficients. Questions without IWF are able to better discriminate between low-performing examinees and high-performing examinees. As this is the first time this correlation has been studied within the pharmacy curriculum, we plan to analyze questions to quantify this information. If this correlation is evidenced in a larger sample size, it will reinforce the need for exam question writing education and training, as having at least one IWF may impact the performance of the question.

**Effect of an Inter-professional Project on Pharmacy and Physical Therapy Student’s Readiness for Inter-professional Learning.** Katie L. Valdovinos, Concordia University Wisconsin, Audrey Kostrzewa, Concordia University Wisconsin, Lois Harrison, Concordia University Wisconsin, Elizabeth Paly, Concordia University Wisconsin. **Objectives:** To assess upper-classman student pharmacists and physical therapists’ readiness for inter-professional learning using a modified Readiness for Inter-professional Learning Scale (RIPLS) Questionnaire before and after an inter-professional learning experience. **Method:** Upper-classman student pharmacists and physical therapists partnered with community-dwelling seniors to complete a fall risk assessment. Student pharmacists completed a pharmaceutical assessment and communicated findings to the student physical therapists. Student physical therapists then completed a full risk assessment and relayed findings to the student pharmacists. Student pharmacists then followed-up with the patient to discuss medication related concerns. Students attended two inter-professional discussion sessions to prepare for and debrief on the project. Students completed the modified RIPLS Questionnaire before and after the experience. **Results:** 74 out of 80 students (92.5%) completed the pre and post modified RIPLS Questionnaire. The percentage of student pharmacists who responded favorably to questions about teamwork and collaboration was 96.83% pre vs. 97.19% post; negative professional identity was 92.86% pre vs. 86.90% post; positive professional identity was 91.97% pre vs. 90.15% post; and roles and responsibilities were 82.14% pre vs. 78.57% post. For student physical therapists these numbers were 96.07% vs. 96.59%, 86.88% vs. 90.50%, 92.39% vs. 94.54%, and 77.78% vs. 86.96%, respectively. **Implications:** No educationally significant differences were found between pre and post questionnaires or between student pharmacists and physical therapists. Although hands-on experience with other students and patients is valuable to student learning, student pharmacists and physical therapists seem to already be well-prepared for inter-professional experiences in their upper-classman years.

**Effectiveness of a Research Seminar for First and Second Year Pharmacy Practice Residents.** Morgan R. Comee, MCPHS University—Worcester/Manchester, Jeffrey Fong, MCPHS University—Worcester/Manchester, Jayne LePage, MCPHS University—Worcester/Manchester,
Objectives: Determine the effectiveness of a research seminar for pharmacy practice residents at UMass Memorial Medical Center. Method: A research seminar was developed by MCPHS University faculty and was provided to the pharmacy practice residents. The seminar was in a workshop format with the following topics: FINER criteria, study proposal, institutional review board, data abstraction, navigating the medical literature, statistics I, statistics II, poster creation/presentation, and manuscript preparation. A survey was administered to attendees at the end of each session. The 4 question survey, using a 5-point Likert scale (1 strongly disagree and 5 strongly agree) assessed for (1) assistance in professional development, (2) clarity of learning objectives, (3) organization of handouts (4) effectiveness of the learning environment (5) suggestions for future offerings. Results: There were 9 seminars during the study period (July 2010 to July 2011) with an average of 7/10 residents in attendance at each seminar. The average ranges (based on the median scores for each question) are as follows: (1) 4.55, (2) 4.83, (3) 4.81, (4) 4.88. The most common comment made by the residents was that they appreciated the interactive nature of the sessions. Suggestions for changes for future offerings were focused on increasing the statistical coverage and have all the seminar dates correspond directly with the due dates of each component of the research project. Implications: The residents recommended that this research seminar be repeated with modifications and thus we recommend other programs offer a similar seminar.

Establishing the Pharmacist’s Role in the Patient Centered Medical Home Model. Nicole Paolini-Albanese, University at Buffalo, The State University of New York, Tina Khadem, St. John Fisher College, Scott Monte University of Buffalo, The State University of New York. Objectives: This referral-based clinical pharmacy program (CPP) has been embedded in a large multi-specialty patient centered medical home (PCMH) since 2005. Patients are referred by physician or mid-level practitioners for a variety of disease states, most commonly diabetes. This project describes the type and severity of patients referred to the CPP to provide decision makers context of the pharmacist’s role and value when integrated into the PCMH care team. Method: Patients are referred as new onset or uncontrolled (intervention group). The first appointment is face-to-face and follow-up is telephonic or electronic until goals are reached. The CPP makes therapeutic recommendations to the prescriber in addition to self-care recommendations to the patient. The PCMH also provides separate team-based management which includes nurse case managers for the diabetic population (control group). Statistical analysis comparing disease states and therapeutic control in intervention and control groups were completed by student t-test or chi-square. Disease severity index was calculated as a 13-point scale scored from automated claims data (Young, 2008). Results: Baseline characteristics between the control and intervention groups were (+SD), age (64.2(11.5) vs. 65.6(11.7), P=0.03), severity index (2.7(1.8) vs. 4.0 (2.6), P<0.001), HbA1c (7.1(1.4) vs. 7.7(1.8), P<0.001), diastolic blood pressure (76(9) vs. 75(9), P=0.003) previous MI (1.0% vs. 5.4%, P<0.001) and previous stroke (2.9% vs. 8.2%, P<0.001), depicting a significantly more complex population in the CPP. Implications: Consideration needs to be given to the complexity of patients referred to the CPP, especially when analyzing value of pharmacist contribution to the overall PCMH care team.
Evaluating Effectiveness of Student Self-Guided Pharmaceutical Calculations Modules with Faculty Oversight. Farivar Jahansouz, University of California, San Diego, Felix Yam, University of California, San Diego, Sarah McBane, University of California, San Diego, Rabia Atayee, University of California, San Diego. Objectives: A self-guided method to teach pharmaceutical calculations (PC) is used during the first year pharmacy curriculum. Our aim was to evaluate this teaching method through administering an identical pre- and post-calculations test. Additionally, we aimed to examine the association between the students’ prior pharmacy work experience and impact on test performance. Method: This study evaluated the effectiveness of a self-guided PC course. The students independently completed faculty-directed pharmacy calculation modules in the first year of the Pharmacy Practice course. Fifty-eight students completed a 20 question pre-test and pre-questionnaire prior to beginning the pharmacy calculations module. The pre-test was given to assess the baseline knowledge of the students’ calculations knowledge. Three months after completion of the PC modules, students were given a post-test to evaluate the effectiveness of this teaching method and retention of knowledge. A paired t-test was used to compare before and after scores. Results: Mean (SD) student test scores three months after the PC module ended were increased by 43.3% (18.3), p < 0.001 compared to baseline. When students were categorized based on their prior pharmacy experience (pharmacy clerk vs. pharmacy technician vs. research assistant), there were no differences in test scores between pre-test or post-test (P = 0.529, p = 0.203, respectively). Implications: Self-guided learning of pharmaceutical calculations was effective in improving students’ PC knowledge. Students demonstrated retention of knowledge gained. Prior pharmacy work experience was not associated with differences in PC performance before or after the self-guided teaching module. This format encouraged active learning and time management.

Evaluating First-year Pharmacy Student Experience with Medical Apps. Jennifer L. Rodis, The Ohio State University, Timothy D. Aungst, MCPHS University – Worcester/Manchester, Yan Cui, The Ohio State University. Objectives: Medical apps are becoming an important resource for various healthcare professionals, including pharmacists. Objectives include 1) Characterize first-year pharmacy student use of medical apps 2) Evaluate first-year pharmacy student perception of skills in finding, evaluating, and using medical apps before and after a focused learning experience 3) Assess student satisfaction and areas of improvement regarding learning experience. Method: First-year student pharmacists enrolled in a pharmacy practice course were surveyed during their first week to gauge students’ perceptions on individual skills of finding, evaluating, and using medical apps. During the course, students reviewed a pre-recorded module about use of medical apps in pharmacy and engaged in a workshop where they practiced evaluating medical apps and discussed their use in practice. Two weeks later, students completed a follow-up survey to assess the impact of the workshop on their perceptions of finding, evaluating, and using medical apps. Survey responses were anonymous, with data analyzed in aggregate. Results: Of the 119 students surveyed (100% response), 82% Agreed or Strongly Agreed that medical apps are beneficial to pharmacy practice. However, 73% of students cited lack of medical apps knowledge as a barrier to using medical apps and less than half Agreed or Strongly Agreed to knowing how to find (44%), evaluate (15%), and use apps in patient care (26%). Implications: This study provides novel data on the use of medical apps by pharmacy students. Post-survey data will report the impact of the workshop on students’ perceptions regarding medical apps.

Evaluating Relationships between Student Performance on the 4th Professional Year Stage Exam and the NAPLEX. Seth P. Brownlee, Northeast Ohio Medical University, Natalie Dahmen, Northeast Ohio Medical University, Sara E. Dugan, Northeast Ohio Medical University, Zhenyu Jia, Northeast Ohio Medical University. Objectives: This research project was designed to evaluate the relationships between pharmacy student performance on locally developed progress exams (stage exams) in the 4th professional year (PY4) and the North American Pharmacist Licensure Examination (NAPLEX), a standardized, national licensing exam. Method: Existing student score reports from PY4 stage exams and NAPLEX were retrospectively evaluated. Individual data from all students graduating in the classes of 2012 and 2013 was de-identified and used to complete the analysis. Students’ scores were excluded from the analysis if any data were missing or incomplete. The Pearson’s Correlation analysis was used to evaluate an association between student performance on NAPLEX (total scaled score) and PY4 stage exam (overall score). Linear regression was used to investigate the association between the two exams by adjusting for demographic parameters. The results from these analyses have been compared and integrated to make final conclusions. Results: Test scores from all eligible students were included in the primary analysis (n = 134). Three students were excluded from analysis. The Pearson’s Correlation Coefficient was 0.66 with p value < 2.2e-16, indicating a strong association between the two exam scores. Secondary analyses included: evaluating for associations between NAPLEX scores and each stage exam score (PY1-PY4), and correlations between the four stage exam (PY1-PY4). Implications: Results will be shared with the College of Pharmacy Outcomes Assessment Committee and may inform future discussions to the P4 stage exam and other assessments in the curriculum. Additional research projects are being planned to further investigate the nature of the relationships between the exams.

Evaluating the Correlation between Attribute Evaluation Scores and Admission Decisions in Pharmacy Program Admissions Interviews. Kristin C. Klein, University of Michigan, Judy Wong, University of Michigan. Objectives: The primary objective of this project was to evaluate whether the interview assessment form recently implemented at our institution successfully identifies candidates who demonstrate the attributes we value. Method: A retrospective review of the candidate evaluation form used to assess twelve different characteristics deemed desirable for success in our PharmD program was performed. The number of positive responses for each assessment question was averaged, and the means were compared between the three admissions categories: admitted, deferred, or rejected. Secondary endpoints included an assessment of the tendency of different admissions decisions made by the evaluators and the mean number of criteria assessed for the three admission statuses. Results: The mean positive scores for those admitted, deferred, or rejected were 77.88%, 60.86%, and 36.64%, respectively. There was a significant difference between each of the groups, p < 0.001. Faculty were more likely to recommend admitting a candidate when compared to students. For the candidates who were rejected from our program, students were more likely to recommend rejecting a candidate than faculty. Implications: The candidates who were offered admission received significantly higher evaluation scores than those who were initially deferred or rejected. This demonstrates that the candidate evaluation form is reliably helping to select candidates who demonstrated the characteristics the College of Pharmacy values most during their admissions interviews. Based on these results, the Admissions Committee has decided to continue to utilize the current evaluation form. Future evaluations will be necessary to verify if matriculated students continue to demonstrate the targeted characteristics throughout the curriculum.
Evaluation of Interprofessional Cross-Cultural Communication Sessions. Lakesha M. Butler, Southern Illinois University Edwardsville, Therese I. Poirier, Southern Illinois University Edwardsville, Min Liu, Southern Illinois University Edwardsville, Rhonda Comrie, Southern Illinois University School of Nursing. Objectives: To assess the impact of interprofessional cross-cultural communication sessions with pharmacy and nursing students using a revised Clinical Cultural Competency Questionnaire (CCCQ) which measures perception of skills, knowledge, confidence in encounters, and attitudes, and a constructed knowledge test. Method: An interdisciplinary team of faculty members from Pharmacy, Nursing, and Speech Communication designed, implemented, and assessed interprofessional education (IPE) sessions focused on Cross-Cultural Communication. The sessions were part of a required pharmacy and a required nursing course. Twenty teams of pharmacy and nursing students (N=160 students) engaged in the two, 2-hour sessions. Sessions included an icebreaker activity, team-based discussions on Beyond the Vital Signs video, and case-based problem solving to identify patient care and communication challenges and application of the LEARN model to engage in culturally competent communication with patients. Students were assessed using the CCCQ and the knowledge test both prior to the sessions and after completing the sessions. A survey measuring student satisfaction with the sessions was also administered at the conclusion. Results: Significant differences were demonstrated for all the measured sub-scales of the CCCQ and the actual knowledge of cross-cultural communication. (p < 0.001). Differences were also noted between pharmacy and nursing students for all the measured variables. Students also indicated satisfaction and enjoyment with the IPE sessions. Implications: Using cross-cultural communication as a thematic area for designing an interprofessional education activity resulted in positive benefits. The sessions provided nursing and pharmacy students an engaging experience of learning from, with, and about each other.

Evaluation of Interprofessional Interactions and Comfort Level between Medical and Pharmacy Students. Victoria M. Vazquez, Bistol – Meyers Squibb, William Jackson, Johanna Golias, Tracey Cannova. Objectives: To assess the interactions and comfort level of exchanges between medical and pharmacy students in efforts to understand communication among healthcare professional students. Method: A standardized survey link was emailed to the deans of all ACPE accredited pharmacy schools and LCME accredited medical schools within the United States, requesting distribution to their students. This survey questioned participants’ interactions with other healthcare professions, interprofessional education experiences, and suggestions for promoting interprofessional collaboration. Results: Over 1500 pharmacy and medical students participated. Overall, greater than 90% of pharmacy and medical students reported having a university affiliated healthcare program. In a didactic setting this past academic year, the majority of pharmacy and medical students reported no interaction. However, the first interaction was most commonly in a clinical setting. Approximately half of pharmacy and medical students reported being “comfortable” or “very comfortable” during this first interaction. Additionally, the majority of pharmacy and medical students “strongly agree” that interprofessional relationships will impact their academic career and “strongly agree” these relationships will improve patient care. Lastly, pharmacy and medical students reported increasing joint clinical rotations and didactic interactions would be beneficial for interprofessional collaboration. Implications: As the healthcare landscape continues to evolve, it is imperative that pharmacy and medical students’ training also advance to encourage interprofessional collaboration in all aspects of patient care in order to improve treatment outcomes.

Evaluation of Patient Outcomes of Student Pharmacist Obtained Medication Histories Versus a Control Group. Justine S. Gortney, Wayne State University, Priyasha Patel, Wayne State University, Lynette R. Moser, Wayne State University. Objectives: To evaluate accuracy and completeness of medication discharge lists and patient outcomes in patients interviewed by student pharmacists (RPhs) vs controls on a heart failure service. Method: Data collected included patient demographics, past medical history (PMH), medication discharge lists, interventions, and hospital visits. Patient groups included: (1) Interviewed: admitted within 72 hours interviewed by a student RPh. (2) Controls (not seen by students). Students worked with preceptors to modify medication histories in EMR and make interventions. Medication discharge lists were evaluated for 7 potential medication discrepancies to calculate endpoints of accuracy and completeness. Other endpoints evaluated were 30 day ER visits and readmission. Results: Patients included: 148 interviewed; 149 controls. Groups were equal in gender and length of stay; interviewed patients were younger (63 vs 65, p<0.01). Students modified 96% of medication histories and made other interventions in 24% of patients. Controlling for PMH and age, univariate analysis showed no difference in accuracy scores but showed about 10% higher in completeness score (p<0.01) amongst interviewed. Interviewed patients had less ER visits at 30 days (8 vs 18, p<0.045) but no difference in readmission (32 vs 34, p=0.85). Implications: This is the first study to show potential student pharmacist impact on ER visits. It has affirmed other studies showing impact of student pharmacists on medication reconciliation and interventions. Impacting the accuracy score of the discharge medication list likely requires alterations in the EMR and working directly with prescribers at discharge.

Evaluation of StrengthsFinder® Themes and Domains in a School of Pharmacy Faculty. Nicole M. Wegryn, Pacific University Oregon, Benjamin Chavez, Pacific University Oregon. Objectives: StrengthsFinder® is an online assessment that provides an individual with a report displaying their top Signature Themes, or strengths, upon completion of a 180-item questionnaire. There are 34 possible strengths categorized into four domains: Executing, Influencing, Relationship, and Strategic Thinking. We aim to describe a profile of a School of Pharmacy (SOP) faculty and administration based on completion of the top strengths of each individual, identified by the StrengthsFinder® assessment, and to identify trends in these themes or domains within the SOP. Method: All SOP faculty and administration were provided complimentary access to complete the StrengthsFinder® assessment, and then asked to submit their top five strengths identified. Individuals were de-identified and categorized into one of three groups: Pharmacy Practice, Pharmaceutical Sciences, or Administration. Years spent in academia was also collected. Results: Signature themes were collected for all faculty (N=25) and administration (N=5). The most frequent theme was learner (64% of faculty; 60% of administration) followed by achiever, input, relator, and responsibility, in that order. Overall, the most common domain was Strategic Thinking (93.3%), and the least common domain was Influencing (26.7%). The results were consistent among all three groups. There were no differences based on years of experience. Implications: Completion of StrengthsFinder® provides insight into the unique strengths of faculty and administration. This information can be useful in tailoring faculty development programs, creating diverse committees, and maximizing the potential of faculty. Continued research is needed to determine what, if any, strengths or domains are predictive of effective faculty.
Evaluation of Student Factors Associated with Pre-NAPLEX Scores. Christina A. Spivey, The University of Tennessee, Marie A. Chisholm-Burns, The University of Tennessee, Stephanie J. Phelps, The University of Tennessee, Sharon K. McDonough, The University of Tennessee, Debbie C. Byrd, The University of Tennessee. **Objectives:** No studies have been published involving the Pre-NAPLEX and factors that may determine Pre-NAPLEX score. The purpose of the study was to address this gap and examine relationships among Pre-NAPLEX scores and pre-pharmacy, pharmacy school, and demographic variables to better understand those factors that may contribute to Pre-NAPLEX performance. **Method:** The study was a retrospective review of third-year pharmacy students’ Pre-NAPLEX scores, demographics, pre-pharmacy factors, and pharmacy school factors. Students were given less than one month’s notice of the scheduling of the Pre-NAPLEX and were asked not to study to ascertain an unbiased assessment of student preparedness. Pearson’s r was used to construct a correlation matrix. Stepwise linear regression was conducted to determine the value of demographic, pre-pharmacy, and pharmacy school factors as predictors of Pre-NAPLEX score. **Results:** Of the 168 included students, the majority were female (60.7%) and non-Hispanic White (72.0%). Mean Pre-NAPLEX score was 68.95 ± 14.5, with scores ranging from 31 to 110. Pre-NAPLEX score was correlated (p<0.001) to race/ethnicity (r=-0.341, with non-Hispanic White students having higher scores compared to minority students), PCAT composite score (r=0.272), and pharmacy school cumulative GPA (r=0.346). The regression model (adjusted R^2=0.311; p<0.001) included: pharmacy school cumulative GPA, race/ethnicity, gender, academic probation, and repeating an academic year. **Implications:** This study highlighted that select demographic, pre-pharmacy, and pharmacy school factors were associated with Pre-NAPLEX outcomes. Such factors may assist colleges and schools of pharmacy to identify students who are at risk for poor NAPLEX performance and require greater preparation.

Evaluation of a Leadership and Advocacy Elective Course in the School of Pharmacy Curriculum. Joshua W. Fleming, The University of Mississippi, Leigh Ann Ross, The University of Mississippi. **Objectives:** To evaluate the impact of a recently implemented Leadership and Advocacy elective course in the School of Pharmacy curriculum. **Method:** Enrolled students were given a pre- and post-survey to assess level in interest in various aspects of leadership, leadership models, political and patient advocacy, and confidence in knowledge/abilities in these areas. Surveys were distributed electronically via Qualtrics. The course was designed to first introduce leadership models and teach basic tenets of effective leadership, then focus on political advocacy at a local, state, and national level, patient advocacy, and importance of pharmacists’ input into patient care decisions. Students participated in mock debates, provided advocacy presentations, and maintained a journal of reflection throughout the course. **Results:** There were 21 second professional year pharmacy students enrolled in the course. Twenty-one students completed the pre-survey and 18 completed the post-survey. The students’ ages ranged between 22 and 38 years. The majority of students (n=17, 81%) reported enrolling in the course to develop leadership skills. In comparing the results of the five-point Likert scale from pre- and post-surveys, there was an increase in confidence in communicating effectively with a legislator (Means: 3.19 and 3.61, respectively) and in identifying ways to be involved with advocacy (Means: 2.67 and 3.72, respectively). **Implications:** The Leadership and Advocacy elective course improved students’ confidence in communication and knowledge/abilities related to advocacy. Student reflective writings further support these findings. Incorporating leadership and advocacy courses into curricula has garnered recent attention and these findings positively support inclusion of these course activities.

Evaluation of a Peer-Led Tutoring Program in a Pharmacy Curriculum. Angela O. Shogbon, Mercer University, T. Vivian Liao, Mercer University. **Objectives:** To evaluate the impact of a peer-led tutoring program on the academic performance of tutees and their perceptions of the program. **Method:** The Rho Chi Academic Honor Society at our College of Pharmacy provides peer-led tutoring to requesting students as one-to-one individual sessions. Students are eligible for 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. The tutees’ performance on exams after each tutoring session was tracked to assess progress in the program. Tutors and tutees completed an online evaluation after each session to document perceptions of the session and for quality improvement. Descriptive statistics was used to analyze the data. **Results:** A total of 37 tutees participated in the individual tutoring sessions, provided by 23 tutors, in 10 first through third professional year courses. A passing score (70% or greater) was achieved in 34 (76%) exams for which students were tutored. The mean(SD) change in exam score after each session was 13.3(13.7) points (out of 100 points). A total of 33 (89%) tutees achieved a passing grade at the end of the course. The online evaluation was completed by 76% of tutees and most reported an improvement in study strategies (89%) and ability to succeed in the course (93%). **Implications:** A peer-led individual 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 Train-the-Trainer Program for Pharmacy Informatics and Health Information Technology. Timothy Cutler, University of California, San Francisco, Amanda Fingado, Xerox, Sokkim Lim, University of California, San Francisco, Bret Brodowy, University of California, San Francisco, Marco Gonzales, Elisa Ashton, University of California, San Francisco. **Objectives:** To evaluate a train-the-trainer program designed to improve pharmacy students’ knowledge of, skills in using, and attitudes toward pharmacy informatics and health information technology (HIT). **Method:** The Accreditation Council for Pharmacy Education standards require competencies in informatics be included in pharmacy student curriculum. Recognizing the lack of content experts available to educate pharmacy students in these areas, an Introduction to Pharmacy Informatics course with 12 distinct online modules was designed. Faculty members from seven California colleges or schools of pharmacy attended a six-hour train-the-trainer session to learn how best to integrate these modules into their existing curriculum. A survey instrument was administered after the training to (1) determine the likelihood of implementation; (2) evaluate participants’ confidence in their ability to train pharmacy students; and (3) provide an assessment of the training. **Results:** A total of 14 faculty members participated in the training. The majority (n=10, 71%) had no prior experience teaching content related to pharmacy informatics or HIT. On average, faculty estimated that 84% (range: 70%-100%) of the content presented in the modules was not covered at all in their existing curriculum. Within 8 months following the program, all eight accredited California schools of pharmacy had integrated the modules into their curriculum and 948 pharmacy students had taken the course. **Implications:** The train-the-trainer approach involved minimal time commitment for all participants, was critical to the ability to reach seven additional schools of pharmacy in a condensed timeline, and can be used as a national model for implementing pharmacy informatics and HIT into curricula.
Evaluation of an Introductory Interprofessional Education Program on Ethics. Maria M. Thurston, Mercer University, Melissa M. Chesson, Mercer University, Ann M. Lucado, Mercer University College of Health Professions, Freida F. Payne, Mercer University Georgia Baptist College of Nursing, Gina J. Ryan, Mercer University. Objectives: To assess student perceptions of learning objective achievement for an introductory interprofessional exercise. Method: An exercise to discuss healthcare-associated ethical dilemmas was developed involving pharmacy, nurse practitioner, and nursing students (n=297). Groups consisting of students from each program were instructed to identify the provision within their code of ethics relating to six case vignettes. Students noted similarities and differences between professions and discussed how to ethically address each dilemma. Upon completion of the exercise, students completed a program evaluation using a four point Likert scale. Results: Eighty-eight percent (n=262) of students completed the evaluation and 172 surveys (58%) were eligible for analysis (n=81 pharmacy, n=11 nurse practitioner, and n=80 nursing). Student responses revealed the majority of the students agreed or strongly agreed that all learning objectives were accomplished: 95% reported the exercise engaged them in interprofessional interactions, 89% increased their ability to understand their profession within an interprofessional context, and 86% believed the exercise provided information that will be used in their professional work. Finally, 93% of students agreed or strongly agreed that the program provided valuable interaction with students from other professions, compared to 73% for valuable faculty interaction. Implications: Program learning objectives were achieved based on assessment of student perceptions of the IPE exercise. Students were engaged in interprofessional interactions and gained a better understanding of their own profession through interactions with both students and faculty; however, further faculty discussion may be warranted. Interprofessional experiences of this nature may help students foster future collaborations as healthcare providers.

Evaluation of the Multiple Mini-interview as a Predictor of Academic Difficulty in the PharmD Curriculum. Seth D. Heldenbrand, University of Arkansas for Medical Sciences, Bryan J. Bordelon, Schwanda K. Flowers, University of Arkansas for Medical Sciences, Bradley C. Martin, University of Arkansas for Medical Sciences. Objectives: Identify admissions factors prognostic for academic difficulty in the Pharm.D. curriculum to use for admissions determinations and identify at risk students. Methods: Groups consisting of students from each program were linked with student academic records to identify students at risk to design targeted educational interventions. Results: Thirty-four students enrolled in the patient assessment elective in the summer of 2013. The course featured a virtual patient program that was originally designed for medical and nursing education. All students completed an online survey that utilized a single group posttest design with a retrospective pretest. Students ranked self-efficacy before and after the course for five ability-based outcomes using a six-point Likert scale (1 = very unconfident, 6 = very confident). Responses were analyzed using the Wilcoxon signed-rank test. Students were also surveyed on the value of course activities and use of the virtual patient program. Results: There was a statistically significant improvement in self-efficacy for all ability-based outcomes (p < 0.001). Student comfort level with physical assessment improved significantly during the course. Supplemental handouts on interpreting physical exam findings as a pharmacist were the highest valued learning activity. The majority (81%) agreed or strongly agreed that incorporation of hands-on practice with live patients would improve the course. Implications: The elective course and use of a virtual patient program significantly improved student self-efficacy in patient assessment. Use of virtual patients may be a unique and innovative way to teach basic patient assessment and introduce physical examination skills to pharmacy students.

Experiential Education (EE) and Instructional Design (ID) Faculty Collaborate to Improve Learning during Institutional IPPE. Teresa J. Lubowski, Albany College of Pharmacy and Health Sciences, Maree C. Michaud-Sacks, Albany College of Pharmacy and Health Sciences, Yuzhu Teng, Albany College of Pharmacy and Health Sciences, Cindy Jablanski, Albany College of Pharmacy and Health Sciences, Laurie L. Briceland, Albany College of Pharmacy and Health Sciences. Objectives: To create an IPPE discussion board assignment that would engage students in self-learning, encourage students to learn interdependently, and foster deeper topic understanding through timely connectivity with EE faculty. Methods: Collaboratively, as an institutional IPPE component, EE and ID faculty created an asynchronous formative assessment platform aligned to foster interstudent learning through peer review, as well as provide timely EE faculty input. Students were required to post responses to pre-assigned topics via a group discussion board; each group was formed by EE to include 5 students assigned to diverse institutions (urban, rural, community, teaching). EE Faculty and group peers reviewed each student’s posted answers in “real time” during the IPPE. A grading rubric was created by collaborating faculty to guide submissions and provide standardization; submissions were graded by EE faculty as Exemplary, Acceptable or Unacceptable, and guidance for improvement was provided. Students and preceptors were surveyed. Results: All 241 students completed the assignment in an acceptable (87%) or exemplary (13%) fashion. Student and preceptor surveys indicated that the assignment had a positive effect on perceptions of Institutional IPPE; student learning was enhanced and preceptors felt students were more engaged. EE faculty collected assessment data, which facilitated remediation of writing skills, refinement of assignments, and recognition of exemplary work. Implications: Discussion board interaction promoted student reflection, conceptualization, and of academic difficulty and now suggest that prior degree(s) reduce the risk of academic difficulty. These results provide an empirical basis for admission determination factors and provide a way to identify students at risk to design targeted educational interventions.

Experiential Education (EE) and Instructional Design (ID) Faculty Collaborate to Improve Learning during Institutional IPPE. Teresa J. Lubowski, Albany College of Pharmacy and Health Sciences, Maree C. Michaud-Sacks, Albany College of Pharmacy and Health Sciences, Yuzhu Teng, Albany College of Pharmacy and Health Sciences, Cindy Jablanski, Albany College of Pharmacy and Health Sciences, Laurie L. Briceland, Albany College of Pharmacy and Health Sciences. Objectives: To create an IPPE discussion board assignment that would engage students in self-learning, encourage students to learn interdependently, and foster deeper topic understanding through timely connectivity with EE faculty. Methods: Collaboratively, as an institutional IPPE component, EE and ID faculty created an asynchronous formative assessment platform aligned to foster interstudent learning through peer review, as well as provide timely EE faculty input. Students were required to post responses to pre-assigned topics via a group discussion board; each group was formed by EE to include 5 students assigned to diverse institutions (urban, rural, community, teaching). EE Faculty and group peers reviewed each student’s posted answers in “real time” during the IPPE. A grading rubric was created by collaborating faculty to guide submissions and provide standardization; submissions were graded by EE faculty as Exemplary, Acceptable or Unacceptable, and guidance for improvement was provided. Students and preceptors were surveyed. Results: All 241 students completed the assignment in an acceptable (87%) or exemplary (13%) fashion. Student and preceptor surveys indicated that the assignment had a positive effect on perceptions of Institutional IPPE; student learning was enhanced and preceptors felt students were more engaged. EE faculty collected assessment data, which facilitated remediation of writing skills, refinement of assignments, and recognition of exemplary work. Implications: Discussion board interaction promoted student reflection, conceptualization, and
integration of didactic learning consistent with Kolb’s Experiential Learning Model. Asynchronous formative assessment and peer review can positively affect EE outcomes, provide useful assessment data, and create a more positive experience for students and preceptors.

Factors of On-Time Graduation Rates. Adam Welch, Wilkes University, Harvey A. Jacobs, Wilkes University. Objectives: To compare early performance measures with on-time graduation status. Additionally, identify correlations with performance measures and success in Pharmacotherapeutics (PT) courses. Method: Retrospective, de-identified data from the last five graduating classes (2009-2013) were categorized by their ability to complete the PharmD program in four years. Early performance measures included pre-requisite and overall pre-pharmacy grade point average, Pharmacy College Admission Test (PCAT) score, and grades in Biochemistry and two Anatomy and Physiology (A/P) courses during the P1 year. The PT sequence is 31 credits over 12 courses in the P2 and P3 years. Failure to graduate on-time can be a result of failing any course that has no immediate remediation option. A Mann-Whitney U test compared early performance measures in the two groups. A Pearson correlation compared performance measures with the mean grade point average in PT, using IBM SPSS Statistics 19 (Armonk, NY). Results: There were 336 students entering the program with a 97.3% on-time graduation rate. The on-time graduating students had significantly better grades only in A/P II (p<.008) and Biochemistry (p<.001). The mean PT grade correlations were as follows (all adjusted): PCAT (r2=.009, p=.045), Biochemistry (r2=.481, p<.001), mean A/P (r2=.467, p<.001), pre-requisite courses (r2=.246, p<.001), and overall pre-pharmacy courses (r2=.215, p<.001). Implications: On-time graduation rates are critically important to schools/colleges of pharmacy. Pre-pharmacy work correlates poorly with ability to graduate on-time but P1 basic science courses have a stronger correlation. Performance in PT correlates strongly with some early measures.

Faculty and Student Attitudes Regarding Humor as an Engagement and Learning Tool. Michael Gonyeau, Northeastern University, Daniel Felix. Objectives: To examine attitudes regarding use and efficacy of humor in teaching and effects on student knowledge/retention and performance, and to analyze types of humor students and faculty find beneficial/detrimental in a large didactic setting. Method: Students and Faculty were asked to complete an online survey evaluating thoughts/attitudes regarding humor as a teaching tool. Participating students were randomized into an online lecture containing humor or one without. After the online lecture, participants completed an online survey assessing student engagement, retention of material presented, and impact of humor on perceptions of professionalism, classroom climate/comfort, as well as identification of types of humor utilized. Two weeks later, each participant completed 5 assessment questions regarding online lecture content. Results: Twenty-six (52%) faculty and 156 students (48%) completed the initial survey. Majority (85%) of students agreed classroom humor is an effective learning/engagement tool with success rates of 61-80%. The most common types of humor observed included visual illustrations/media (92%) and funny comments/stories (88%), which correlated with faculty responses. Faculty stated humor humanizes the instructor and engages, but risks offending students. The post-online lecture survey revealed students who experienced the humorous version identified >80% of humor strategies utilized, and were more likely engaged and to remember content (p=0.04) versus non-humor lecture. Implications: Faculty and students perceived humor to aid in student engagement in the didactic setting, with most common examples including funny comments/stories and illustrations/media. Students were able to identify types of humorous strategies utilized in an online lecture and identified increased engagement and knowledge retention.

Family Commitment and Work Challenge among Pharmacists. Nalin Payakachat, University of Arkansas for Medical Sciences, Denise Ragland, University of Arkansas for Medical Sciences. Objectives: To explore factors associated with family commitment among pharmacists in the U.S. South Central region. Method: A cross-sectional self-administered survey was sent out to active licensed pharmacists in the U.S. South Central region (AL, AR, KY, LA, MS, OK, TN, TX) using stratified random sampling methods with a target sample size of 381. The survey was categorized into 4 areas: demographics including need and satisfaction with family commitment (a scale of 0 to 6), job features including the extent of being professionally challenged at work (work challenge, a scale of 1 to 4), preceptorship, and personal perspectives. Only participants who reported being married were included in final analysis. Robust ordinary least squares regression and t-test were employed in this study. Results: Among 363 participants, 269 (74%) were married with an average age of 48 (SD=18) years old. The male to female ratio was 1:1 in the married group. 73% worked in retail settings. 199 (74%) completed the family commitment questions. Females reported a higher need for family commitment than males (5.1 vs. 4.6, p=0.02) but there was no significant difference in satisfaction with the commitment. Work challenge was significantly associated with higher need and satisfaction with family commitment (p=0.05), when controlled for age, gender, and a number of dependents. Self-reported stress related to work was also significantly correlated with work challenge (p=0.001). Implications: Work challenge may negatively impact family function and increase work-related stress. Work-family interactions should be further investigated in pharmacy careers especially in retail settings.

Go Online: Student Experiences with an Online Journal Club Class Activity. Yolanda M. Hardy, Chicago State University, Janene L. Marshall, Chicago State University. Objectives: To discuss the implementation of and student experiences with a student-led, faculty-facilitated, online journal club activity that has been incorporated into a case based, drug therapy management course. Method: Prior to the online discussion, students were required to read a selected article on a clinical trial and submit a group written assessment of the article. Faculty members served as facilitators, and were provided with questions that could be used to aid in the 30 minute discussion. To ensure maximum participation, multiple sessions were run concurrently, allowing for a maximum of 15 students in each discussion room at a time. Following the online discussion each student completed a reflection on their thoughts on the article after having completed both activities, and on whether the online activity helped to improve learning. The activity was offered twice during the semester. Based on student suggestion, the second discussion was extended by 15 minutes. Results: Overall, students enjoyed the activity. Faculty reported positive comments about the activity, and noted that discussion amongst the groups varied. Approximately 96% of the class submitted both reflections. Though 83% of students stated that the online discussion did not change their thoughts about the article, 88% responded that it helped to clarify areas of uncertainty they had regarding the article. Seventy-seven percent stated that they felt like they learned more as a result of participating. Implications: Online journal club discussions can offer an alternative to traditional journal club discussions.

Health Professional Students’ Preparedness for Interprofessional Practice. Alexa M. Sevin, Maria C. Pruchnicki, The Ohio State University, Timothy R. Ulbrich, Northeast Ohio Medical University,
Sarah E. Adkins, The Ohio State University, Michelle A. Maguire, Christopher C. Green, The Ohio State University Wexner Medical Center, Nicole V. Brown, The Ohio State University Center for Biostatistics. Objectives: To evaluate health professions students’ understanding of their own and others’ roles in interprofessional (IP) teams based on the Interprofessional Education Collaborative core competencies; to assess students’ perceptions of their preparedness to practice in an IP team and determine differences by type of learning institution and participation in interprofessional education (IPE). Method: In 2012-13, an original survey was developed and distributed to medical, nursing, and pharmacy students at three Ohio universities with varying degrees of IPE. Descriptive statistics, analysis of variance (ANOVA), chi-square, and two sample t-tests were used to compare measures of knowledge, IPE, and preparedness. Results: 981 students were invited to participate; 274 completed the survey (27.9% response). Overall, 70.8% (192/271) of students felt prepared to work on an IP team. Students who reported participation in IPE were more likely to feel prepared to practice on an IP team compared to those who did not (76.8% [149/194] vs. 55.8% [43/77], p = 0.0006). Participation in IPE did not significantly affect knowledge scores (participants 80% vs. non-participants 81%, p = 0.1725). A significant difference in profession-specific knowledge scores were found between those who felt prepared to work with that specific profession and those who did not (nurse 77% vs. 69%, p = 0.0020; pharmacist 82% vs. 71%, p < .0001; physician 88% vs. 79%, p = 0.0039). Implications: IPE increases student reported preparedness for collaborative practice through advancement of skills and behaviors; however, this does not appear to be associated with knowledge of roles and responsibilities. Future research should investigate those competencies to identify IPE methods that best prepare students for IP practice.

Health Screenings and Education for the Underprivileged. Vanessa G. Phillips, University of the Incarnate Word, Tina C. Lopez, University of the Incarnate Word, Thomas C. Shank, University of the Incarnate Word, Kevin C. Lord, University of the Incarnate Word. Objectives: Determine access to health care of a local homeless shelter population. Determine if education provided by pharmacy students improves awareness about hypertension, diabetes, and hyperlipidemia. Method: Residents of a local homeless shelter were invited to participate in an anonymous written 13-question survey assessing the respondent’s current access to health care. Pharmacy students offer free health screenings and education to shelter residents about once a month. Residents were given a nine-question test before and after education on hypertension, diabetes and hyperlipidemia. The methods, survey, and test were approved by the University IRB. Results: Twenty-four residents participated in the access to health care survey and 96 participated in the pre and post education tests. Most residents had no insurance (58%), few had state or county insurance (33%), and two were unsure (8%). Most residents use the nearby free clinic (67%), few use other clinics (25%), and two used none or were unsure (8%). Only one third of the residents stated that they have a specific primary care physician. The pre and post tests showed significant improvement in residents’ knowledge of hyperlipidemia definition and risk factors; knowledge of diabetes risk factors; and hypertension risk factors (p < 0.05 for each). But did not affect residents’ knowledge of the definition of hypertension or diabetes. Implications: The homeless shelter is near large hospitals with free clinics, but residents do not perceive the providers as their primary care physicians. Pharmacists and students effectively provide essential education of health services, and education of common disease states to the residents.

High School Students’ Perceptions of a Career in Pharmacy Following a Clinical Skills Problem-based Learning Program. Sheilia M. Wilhelm, Wayne State University, Francine D. Salinitri, Wayne State University. Objectives: To evaluate the impact of a clinical skills problem-based learning (PBL) program on high school students’ perceptions of a pharmacy career and a PBL experience. Method: A three-day clinical skills PBL experience was offered in eight Anatomy and Physiology courses at two public high schools. On day one, students completed a pre-survey, viewed a multi-media presentation about pharmacy, and, in teams of 4-5, completed a facilitated PBL hospital case. The following day, a community case was facilitated. On day three, teams completed a four-station clinical skills challenge, a post-survey and partook in a question/answer session with pharmacy students and residents. Descriptive statistics and Fisher’s exact test were used. Results: One-hundred ninety-one students were enrolled in the program; 177 completed the pre-survey (92.7%); 175 completed the post-survey (91.6%); and 149 surveys were matched (78%). Among matched surveys, the number of students considering a career in healthcare did not change (102 vs. 107; p = 0.522). The number of students considering a pharmacy career increased (31 vs. 54; p = 0.0031). Students’ perceptions regarding the accessibility of health-care providers shifted from physicians to pharmacists (p = 0.00024). Students’ perceptions of the program indicated >85% agreement with receiving enough direction on how to work effectively in teams, understand what student-derived information was needed and apply information retrieved. Over three-quarters of the group agreed there was enough time to learn about and look up information for the cases. Implications: A clinical skills problem-based learning program was well accepted by high school students and increased their interest in a career in pharmacy.

Identifying the Concurrent Validity of Patient-centered Communication Tools (PaCT) for Pharmacy Student Communication Skills. Gloria Grice, St. Louis College of Pharmacy, Peter D. Hurd, St. Louis College of Pharmacy, Clark Kebodeaux, St. Louis College of Pharmacy, Nicole M. Gattas, St. Louis College of Pharmacy, Theresa R. Prosser, St. Louis College of Pharmacy, Amy M. Tienmeier, St. Louis College of Pharmacy, Mychal Voorhees, Tricia M. Berry, St. Louis College of Pharmacy, Paul Juang, St. Louis College of Pharmacy, Alexandra M. Garavaglia Wilson, St. Louis College of Pharmacy, Janelle E. Mann, St. Louis College of Pharmacy, Elizabeth Rattinge-Flaherty, St. Louis College of Pharmacy. Objectives: PaCT is a patient-centered communication framework. Face, content, and construct validity and reliability of a PaCT assessment rubric was published previously. Our objective was to evaluate concurrent validity of PaCT by comparing the same students’ scores across three courses using different communication rubrics. Method: P1 students performed a patient counseling activity in Professional Communications (PC). P3 students completed a provider or patient communication exercise in Therapeutics 4 (T4) and a patient encounter in Advanced Pharmacy Practice (APP). The APP exercise was scored using PaCT, measuring 23 skills grouped in five tools: (A) Establish a Connection, (B) Explore and Integrate the Patient’s Perspective, (C) Demonstrate Interest and Empathy, (D) Collaborate and Educate, and (E) Communicate with Finesse. Other internally developed rubrics assess the PC and T4 exercises. Results: PC and PaCT scores correlated (r = 0.175, p < 0.05). PaCT tools C and E and PC scores also positively correlated (p < 0.05), reflecting similar skills performed between PC and APP exercises. There was no correlation in overall T4 and PaCT scores (r = 0.112, p > 0.05) or between any PaCT tool and T4 scores likely reflecting differences in the activity and skills evaluated. There was,
however, significant correlation between T4 scores and three individual PaCT skills. **Implications:** Results support concurrent validity of PaCT compared to the PC rubric. The T4 and APP exercises emphasized different skills (provider communication in T4 and patient communication in APP). However greater correlation was anticipated within Tool E. Regardless of target audience, alignment in the expectations of general student communication may be necessary.

**Impact of Geriatric Sensitivity Training on Student Pharmacist Attitudes and Perceptions of Aging.** Amber M. Hutchison, Auburn University, Marilyn N. Bulloch, Auburn University, Brent Fox, Auburn University, Margaret A. Williamson, Auburn University, Lynn Stevenson, Auburn University. **Objectives:** The primary objective of this study was to evaluate student pharmacists’ empathy toward geriatric patients before and after participation in a geriatric sensitivity workshop. The secondary objective was to evaluate student perceptions regarding older adults’ ability to self-manage medications.

**Method:** First year student pharmacists participated in a workshop during orientation using The SECURE Project age sensitivity training which demonstrates common sensory changes in older adults. Students participated in a voluntary, anonymous online survey before and immediately following the workshop. Baseline demographic information was collected and empathy was assessed using the validated Kiersma-Chen Empathy Scale (KCES). A paired t-test was used to evaluate empathy scores and Wilcoxon Signed-Rank was used to evaluate Likert-type data. **Results:** The workshop was presented to 150 students. A total of 126 (84%) completed both the pre and post-surveys and 40.7% of students reported having intermittent interaction with older adults. The KCES mean pre-activity score was 85.4 compared to post-activity score of 89.2 (p < 0.001). After the workshop, more students believed it would be extremely difficult for a visually impaired geriatric person to take medications (38.7% vs. 56%; p < 0.001). Following the activity, more students believed it would be extremely difficult for geriatric patients to comply with medication instructions (9.3% vs. 27.3%; p < 0.001) and to recall medication names (30% vs. 36%; p = 0.001).

**Implications:** Many students report having intermittent interaction with older adults and a workshop using age sensitivity training improved student pharmacist empathy towards geriatric patients. Students were more likely to recognize barriers to self-medication management experienced by geriatric patients after training.

**Impact of a Parenteral Product Program on Students’ Perceived Proficiency.** Brittney A. Meyer, South Dakota State University, Jane R. Mort, South Dakota State University, Tarryn Jansen, South Dakota State University, Jodi R. Heins, South Dakota State University, Janet R. Fischer, South Dakota State University. **Objectives:** Determine the impact of a parenteral product program on students’ perceived proficiency in skills and knowledge of parenteral product preparation. **Method:** A new parenteral program was implemented in the spring of 2013 and included second year (P2) students practicing in simulated acrylic hoods, performing peer evaluations, simulating actual hospital involvement with academic performance.

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purposes, ratings of satisfactory, needs minor revision, and needs improvement were given 3, 2, and 1 points; respectively. **Results:** The total mean score from the first to the last preceptor evaluation of SOAP note writing improved from 93.56 (range 88-102) to 98.57 (range 96-103) out of 105 possible points. The mean score of each section of the SOAP note also improved. The average self-evaluation score was 100 (range 94-104) and average peer-evaluation score was 102.11 (range 97-104). **Implications:** Repeated formative evaluation of SOAP note writing over a 5-week APE block was a useful tool for feedback to students and improved preceptor evaluation scores over time. Self- and peer-evaluation scores were higher than preceptor scores.

**Implementation of Peer-Assessment Within a Drug Literature Evaluation Course.** Bhavini T. Parikh, Purdue University, Amy H. Sheehan, Purdue University. **Objectives:** To evaluate second professional year student pharmacists’ knowledge, experiences, and perceptions of peer assessment before and after implementation of in-class peer assessment within a drug literature evaluation course. **Method:** Student pharmacists were invited to complete an electronic survey instrument regarding their knowledge and previous experiences with peer assessment. An instructional lecture was provided to describe appropriate methods for conducting peer assessment. Throughout the remainder of the semester, students were required to complete three written assignments critiquing published literature. One week prior to the due date of each assignment, time was set-aside in class to allow students to assess each other’s first draft. After all assignment grades were posted, students were invited to complete a post-survey regarding their perceptions of peer assessment. **Results:** The response rate was 75% (N=108/144). At baseline, 38% of students reported receiving previous training on how to provide feedback and constructive criticism, while 87% reported using peer assessment in previous experiences. Students stated that they had a favorable experience and had adequately learned about peer assessment, which increased from 62% and 42% at baseline, to 83% and 90%, respectively. The majority of students reported that they believed peer assessment helped them realize areas that needed attention within their own paper (94%), feedback was useful throughout the semester (92%), and helped them feel prepared to submit their final assignment (84%). **Implications:** The results of this study provide insight into the value of implementing peer assessment activities within a didactic setting prior to experiential rotations and graduation.

**Implementation of a Longitudinal Interprofessional Education Learning Experience.** Kim M. Jones, Union University, Joy B. Greene, Union University. **Objectives:** The purpose of this investigation was to assess baseline knowledge of pharmacy, social work and nursing students concerning the duties completed on a regular basis by a pharmacist, social worker, nurse and physician. Attitudes and beliefs of pharmacy, social work, and nursing students regarding the value of interprofessional learning activities and its impact on the healthcare team were also assessed. **Method:** During the 2012-2014 academic years, healthcare students collaborated to evaluate patient cases in a small group, roundtable setting. Feedback was elicited following each patient case to evaluate student perceptions regarding each discipline’s contribution to the healthcare team. A survey was designed and administered to assess students’ knowledge of the duties provided by pharmacists, social workers, nurses and physicians. The survey instrument also included questions assessing students’ attitudes and beliefs regarding the benefit of interprofessional learning activities. **Results:** Forty-three percent of respondents (n = 120) indicated no experience working in a healthcare setting. Respondents (n = 118) indicated that learning activities with the following healthcare students (pharmacy (91%), social work (76%), nursing (89%), medicine (88%)) will enhance their effectiveness as a member of the healthcare team. Respondents (n = 116) indicated that learning activities with the following healthcare students {pharmacy (91%), social work (82%), nursing (91%), medicine (90%)} will improve patient outcomes. **Implications:** Although a majority of students reported value in learning with other healthcare students, assessment data demonstrates a need for further education regarding knowledge of routine duties provided by pharmacists and social workers.

**Implementation of a Required Interprofessional day Experience Between Three Non-affiliated Health Science Schools.** Miranda J. Wilhelm, Southern Illinois University Edwardsville, Katie E. Ronald, Southern Illinois University Edwardsville, Gloria Brummer, St. John’s College. **Objectives:** To describe implementation and evaluation of a required interprofessional day experience for student pharmacists from a large state university, student nurses attending a special purpose college and student respiratory therapists from a community college. **Method:** Three institutions collaborated to develop a two-day, required interdisciplinary experience for pharmacy (n = 74), nursing (n = 43), and respiratory students (n = 9). Students were divided into 16 teams of 6-9 students and rotated through various events throughout a day, including: (1) small group Jeopardy game; (2) high-fidelity simulation and debriefing; (3) panel of practitioners discussing collaborative practice roles. Pre-assessment included a voluntary survey including the Readiness for Interprofessional Learning Scale (RIPLS). Post assessment included RIPLS and an additional 17 question survey to measure student perception of the interprofessional experience. **Results:** 76% of students completed the pre-survey and 42% completed the post- survey. Data from 4 students was evaluated in a matched paired t-test. No significant differences were found in RIPLS scores, both matched and unmatched. Despite no difference in pre-and post-RIPLS, the RIPLS revealed that students had a high readiness for interprofessional learning. Post-assessment survey results indicated that many students felt unprepared for the interprofessional high-fidelity simulation although the overall experience was rated positively. **Implications:** RIPLS scores indicate a high readiness for interprofessional learning. Perception survey results were highly favorable toward the value of the interprofessional experience. Ways to improve student preparation will need to be addressed.

**Implementation, Design, and Preceptor Perceptions of a Preceptor-facilitated Self-care Pharmacy Practice Course.** Mark A. Della Paolera, Pacific University Oregon, Jeff Fortner, Pacific University Oregon, Irene Croswell, Haggen’s Pharmacy. **Objectives:** To describe an innovative, preceptor-facilitated, self-care pharmacy practice course, and how it may be implemented within pharmacy programs; to assess preceptor perceptions of whether the design of this course is better than traditional didactic lectures at holding students to greater accountability of learning, preparing students for Introductory and Advanced Pharmacy Practice Experiences (IPPEs and APPEs), and promoting learning beyond the classroom. **Method:** Ninety-three first-year students were enrolled in a semester-long, 3 hours bi-weekly, self-care course. Students (n=93) were divided into teams and each assigned a preceptor (n=14) who were primarily adjunct faculty, community-based pharmacists. Preceptors facilitated activities and case-based discussions, assessed and provided feedback on patient consultations, and provided summative performance-based feedback at the semesters’ end. Students had mandatory attendance, bi-weekly quizzes, and patient consultation exercises. All preceptors completed surveys to provide feedback about the course. **Results:** Eighty-seven students passed the course and 6 students were required to complete
extended learning. All 6 of these students passed extended learning. Preceptor feedback stated 86% agreed or strongly agreed the format of the course both held students to greater accountability and promoted learning beyond traditional didactic lectures; and, 93% of preceptors agreed or strongly agreed the format of the course helps prepare students for their IPPEs and APPEs. **Implications:** This preceptor-facilitated course design may be more effective than traditional didactic lectures at promoting learning and preparing students for IPPEs and APPEs. With adequate resources (preceptors, finances, logistics), this course design could be implemented within other pharmacy programs.

**Implementing Interprofessional Education at a Small, Rural University: Best Practices and Lessons Learned.** Natalie A. DiPietro, Ohio Northern University, Michelle R. Musser, Ohio Northern University, Susan M. Montenery, Ohio Northern University, Sara L. Terrell, Ohio Northern University, Lisa L. Walden, Ohio Northern University. **Objectives:** Training of students in healthcare-related disciplines is increasingly emphasizing interprofessional education (IPE). A small, rural university desired to implement IPE activities to expose students to healthcare disciplines, to encourage communication and decision-making within teams, and to improve curricular connectivity. The objective of this poster is to share insights from faculty at this institution. **Method:** Pharmacy, nursing, exercise physiology, and medical laboratory sciences faculty at a small, private, rural university collaborated to create patient cases containing clinical and cultural issues. In two separate exercises, students at the junior-level/P3 (of a 0-6 pharmacy program) and senior-level/P5 in each discipline worked in teams. All cases involved culturally diverse patients; junior-level cases focused on self-care while senior-level cases required advanced therapeutic recommendations. Each group submitted a single, standardized response. Faculty applied rubrics to assess appropriateness of responses and references utilized. Students completed the Readiness for Interprofessional Learning Scale as a pre-and post-test. Additional post-test questions assessed students’ understanding of other disciplines and application of cultural competency. Comments were gathered through open-ended post-test questions and course evaluations. Presentation of the exercises’ outcomes was approved by the university IRB. **Results:** Comparison of pre- and post-test results and feedback received from students and faculty indicate the activities were impactful learning experiences. **Implications:** Many undergraduate health profession students, especially at small, rural universities, have limited exposure to learning across disciplines. IPE provides students opportunities to practice necessary skills, but implementing new activities can be challenging. Reviewing best practices and lessons learned at other universities will aid faculty in designing IPE activities.

**Improved Organizational and Student Outcomes in an Early Immersion Program at an Academic Medical Center.** Jacqueline McLaughlin, University of North Carolina at Chapel Hill, Lindsey Poppe, University of North Carolina at Chapel Hill, Shih-Li Chen, Nick Luter, Justin R. Arnall, University of North Carolina at Chapel Hill, Shanya Smith, Mary R. McClurg, University of North Carolina at Chapel Hill, Philip T. Rodgers, University of North Carolina at Chapel Hill, Shanya Smith, Mary R. McClurg, University of North Carolina at Chapel Hill, Dennis M. Williams, University of North Carolina at Chapel Hill, Nicole Pinelli, University of North Carolina at Chapel Hill. **Objectives:** The Student Medication and Reconciliation Team (SMART) program was designed to provide second-year student pharmacists with early experiential learning involving direct patient care in an academic medical center. The purpose of this study was to examine the impact of early immersion on students, pharmacists, and the academic medical center. **Method:** Twenty four second-year student pharmacists at the UNC Eshelman School of Pharmacy were randomly selected from volunteers to participate. Each participant completed program training and hospital orientation prior to completing three five-hour evening shifts over the course of two months. A pre-survey, post-survey, and reflection statements were collected from participants. Organizational performance metrics and pharmacist perceptions were also collected. This study was IRB approved and informed consent was obtained. **Results:** Preliminary results (n = 12 students) demonstrate improved student pharmacist self-efficacy (p < 0.05) and positive student perceptions of the program. A total of 48 medication histories were performed on complex medical patients (55.5 ± 20.1 years, 54% male, 73% Caucasian, 10.3 ± 4.9 medications); of those, 94% were completed within 24 hours of hospital admission. Second-year student pharmacists completed on average 2.0 ± 0.7 medication histories per shift. The program has been well received by clinical pharmacists involved in its design and implementation. **Implications:** Early immersion of second-year student pharmacists can enhance student development, benefit pharmacists, and improve organizational performance in an academic medical center.

**Incorporating Cultural Competency and Health Literacy into a Public Health Course: A Qualitative Analysis.** Zara Risoldi Cochrane, Creighton University, Linda K. Ohri, Creighton University, Kevin T. Fuji, Creighton University. **Objectives:** To systematically identify, using qualitative analysis, students’ comprehension and application of cultural competency and health literacy concepts delivered in a public health course. **Method:** A two-hour lecture series was incorporated into a public health course for second-year pharmacy students in the spring of 2013. Following this series, students were administered a Classroom Assessment Technique (CAT) prompt. The prompt asked them to describe an activity they could implement to make their current or future healthcare organization more health literate or culturally competent, and how this activity would contribute to population health. Students’ responses were analyzed using an iterative thematic analysis. Responses were first coded individually by three independent researchers, followed by a group discussion to identify categories and emerging themes. **Results:** Six themes emerged from the data analysis, indicating that students 1) reiterated lessons presented in class; 2) identified both self-directed and other-directed strategies; 3) identified the impact of proposed strategies on health outcomes; 4) planned the use of already-available resources and development of new resources; 5) demonstrated an awareness of various cultural groups and changing cultural dynamics; and 6) focused their attention on addressing issues related to language. **Implications:** Students’ life experience and pharmacy work experience provide a rich context for reflection on and understanding of cultural competency and health literacy. There is a need for reinforcement of these concepts in other required courses using both didactic and experiential approaches in order to facilitate application of these concepts by students, rather than simple reiteration of lessons presented in class.

**Incorporation of Top 200 Drug Knowledge into a Medicare Part D Didactic and Experiential Learning Course.** Suzanne M. Galal, University of the Pacific, Amy Pham, University of the Pacific, Amaw Awad, University of the Pacific, Alexander Luong, University of the Pacific, Rajul A. Patel, University of the Pacific, Sian Carr-Lopez, University of the Pacific, Joseph A. Woelfel, University of the Pacific. **Objectives:** Evaluate the effects of implementing top 200 drug knowledge into a Medicare Part D elective course as it relates to self-perceived confidence, weekly quiz scores and medication therapy management (MTM) interventions performed. **Method:** Medicare Part D is an elective course spanning two semesters containing
a didactic and experiential component. Students completed a pre- and post-assessment of their confidence in regards to specific aspects of the most commonly prescribed drugs such as brand/generic alternatives, identification of therapeutic class, adverse effects, contraindications, Beer’s Criteria, counseling points, and common doses of the most commonly prescribed medications. Top 200 drug knowledge was assessed through weekly cumulative quizzes. Towards the end of the semester, students performed MTM interventions on Medicare beneficiaries and data was collected on what type of intervention took place. 

**Results:** Forty five students completed the course. Wilcoxon Signed Ranks statistical analysis showed a significant difference between pre and post perceived confidence (p<0.01). Each students performed MTM interventions ranging from 4 to 22. There were no significant correlations between total number of quiz questions correct, self-perceived confidence and MTM interventions performed. **Implications:** The incorporation of top 200 drug knowledge into the course and the application of knowledge through MTM interventions significantly increased student confidence. The high volume of MTM interventions performed may suggest that there was a successful transference of knowledge into pharmacy practice. However, no statistical significant correlations between other measures may lead to other assessment strategies utilized in the future.

**Incorporation of an Academic Service Learning Component into a Diabetes Education Elective.** Nissa Mazzola, St. John’s University, Regina Ginzburg, St. John’s University. **Objectives:** Academic Service-Learning (AS-L) is a classroom-based program that involves students in some form of required community service activity and uses that activity as a means of understanding course concepts. Our intention was to determine whether incorporating an AS-L component would enhance student perceptions of patients with diabetes and improve their overall experience in the class. **Method:** Students were asked to develop a 5-7 minute educational video on an assigned topic of diabetes self management education (DSME). Students were split into small groups and worked to develop a script to be approved by the instructor. With grant funding, a videographer was hired to provide recording of the DSME topic. The videos were intended to be shown in the waiting room of a family medicine practice. **Results:** Students were asked to write a guided reflection paper on their experience using a four stage reflection process and to complete a brief survey on the topic. Most students (94%) felt the AS-L component changed their perception of treating patients with diabetes and that it should remain part of the course. **Implications:** Including an AS-L component into a diabetes elective class can provide valuable perspective for students. Future implications include adapting the service component to include educating patients in the community.

**Infectious Diseases Education across US Pharmacy Schools: What is being Taught and How?** William A. Prescott, University at Buffalo, The State University of New York, Lauren Stuczynski, University at Buffalo The State University of New York, Elizabeth Dahl, University at Buffalo The State University of New York, Jack Brown, St. John Fisher College, Tina Khadem, St. John Fisher College, Fred Doloresco, University at Buffalo, The State University of New York. **Objectives:** To determine the extent infectious diseases is taught at US PharmD programs and to characterize what is being taught and how. **Method:** A validated 39-question online survey was sent to all accredited and candidate status US PharmD programs. **Results:** A total of 94/128 programs responded to the survey (73.4% response rate). Demographics of responding programs were similar to US PharmD programs as a whole. Ninety-three programs (98.9%) indicated infectious diseases topics were included within their required curriculum (mean = 70.9 +/- 34.5 contact-hours, median = 68 contact-hours). Therapeutic drug monitoring and community acquired pneumonia were the most common topics within the required curricula (100% of respondents). A stand-alone infectious diseases elective was offered by 43.2% of responding programs (mean = 24.4 +/- 13.5 contact-hours, median = 28 contact-hours). Laboratory tests to direct antimicrobial therapy, selection of empiric therapy, and antimicrobial stewardship were the most common topics within the elective curricula (68% of respondents). Lecture and case-based learning were the most commonly used instructional methods in both required and elective courses, with lecture being cited as the most commonly used technique. **Implications:** Nearly all of the responding programs included infectious diseases topics within their required curricula, although there was variability with the extent to which it is taught and what topics are covered. In contrast, less than half of responding programs offered an infectious diseases elective. Consensus is needed regarding the extent to which infectious diseases should be taught and what content should be covered within US Pharmacy curricula.

**Integrating Electronic Medical Records (EMR) into a College of Pharmacy Curriculum.** Aimon C. Miranda, University of South Florida, Erini S. Serag-Bolos, University of South Florida, Shyam Gelot, University of South Florida, Sheetal P. Dharia, University of South Florida. **Objectives:** The Accreditation Council for Pharmacy Education (ACPE) deems informatics as an essential element to the pharmacy curriculum. The objectives of these activities are to familiarize students with components and functionalities of EMRs and assess confidence level with utilizing EMRs before and after simulation activities. **Method:** Third year pharmacy students (P3) were surveyed prior to and following eight simulation cases that required submission of SBAR notes (situation, background, assessment, and recommendation). Surveys were administered through Qualtrics®. Collected data included: demographic information (age and gender), years of pharmacy experience (site specific in average hours/week), types of experience, and introductory pharmacy practice experiences (IPPE) rotations completed. Questions related to comfort and expertise on their EMR experience utilized a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree). **Results:** Fifty students completed the pre-survey and twenty-seven students completed the post-survey, which included twenty-three questions. The questions with the largest difference between the pre- and post-survey, respectively, were: “I prefer paper medical records to EMRs in real life practice settings” (1.77 vs. 2.26); “I prefer paper medical records to EMRs in class/ses- seminar/lab” (2.06 vs. 2.48); and “I am comfortable presenting pa- tients to a preceptor” (2.48 vs. 2.93). **Implications:** The direct benefits to students include improved understanding of EMRs, which is integral in assessing pertinent patient information and in preparing for advanced pharmacy rotations. Such education will likely improve student competence and confidence with EMRs as an essential health-care tool.

**Inter-rater Reliability of a Care Plan Grading Rubric in a Team-taught Pharmacy Therapeutics Case Course.** Tracy Sprunger, Butler University, Alex N. Isaacs, IU Health, Tracy Costello, Butler University, Alison Walton, Butler University. **Objectives:** To evaluate the inter-rater reliability of a care plan grading rubric in a team taught pharmacy Therapeutics Case series. **Method:** The Therapeutics Case series at Butler University is an application based 1-credit hour companion course to the 3-credit hour Therapeutics lecture series spanning 4 semesters. Select pharmacotherapy care plans during the fall 2012 semester were evaluated by two independent raters utilizing a newly implemented electronic rubric. The rubric assesses the content
of students’ care plans based on nine categories and four levels of competency providing a total score from 0 to 10. Intra-class correlation was calculated for each category and total score. Following the implementation of the rubric, students and faculty were presented with a voluntary survey to gather feedback about the rubric. Results: Three hundred and twenty two care plans were evaluated by two raters. Total scores demonstrated very good or good agreement for reliability (0.675-0.95). Category scores varied among the care plans with assessment of monitoring parameters having consistently poor reliability. Survey results showed a majority of favorable opinions from both students and faculty in regards to the usefulness of the rubric. Implications: The Therapeutic Case series provides an advantage of having small student:faculty ratios (~15:1) that encourage discussion; however, a major challenge is the objectivity and variability of care plan evaluation between the multiple faculty members involved. Although consistent reliability was seen in total scores; significant variability existed among the individual categories. Further rubric refinement and faculty development will be required to improve reliability.

Interactive Physical Assessment Modules Integrated into an Introductory Practice Management Course. Joseph Ferullo, MCPHS University - Boston, Steven J. Crosby, MCPHS University - Boston, Catherine Taglieri, MCPHS University - Boston. Objectives: Evaluate the use of interactive modules to train and assess PY1 students on physical assessment skills. The core domains related to IPPE rotations include basic physical assessment and administration technique for different dosage forms. The Introduction to Practice Management course presents these principles to PY1 students in a simulated pharmacy setting. Method: In the fall semester foundational objectives of physical assessment and medication administration were introduced via didactic lectures. During the spring, a laboratory component was added. Structured modules, focused on the disciplines of pulmonology, cardiology and endocrinology were designed and implemented via student-directed learning and faculty-student interaction. Pre-laboratory written assignments required student research and fostered product recognition (e.g. inhalers, insulin) and device utility (e.g. stethoscope, blood pressure cuff, glucometer) as well as the ability to define quantitative and qualitative aspects applicable to the module disciplines. Interactive posters allowed for faculty-guided discussion and hands on exposure to devices with PY1 students, addressing clinical concepts germane to the various modules. Results: Assessment of proficiency was accomplished in both didactic and laboratory settings. When instruction was solely didactic, 70.11 percent of the students responded correctly versus 82 when the interactive modules were utilized. In addition, 89 percent of students surveyed (n=45) agreed or strongly agreed that the interactive modules improved their knowledge and 75 percent felt (n=42) that the modules were useful in preparation for introductory rotations. Implications: Integrating an interactive physical assessment module into the curriculum represents an expansion of the PY1 skill set and enhances student learning and interaction.

Interprofessional Diabetes Education: Implementation and Readiness. Beth E. Welch, Western New England University, Izabela A. Collier, Western New England University, Shannon Kinney, Western New England University. Objectives: 1. Describe a diabetes interprofessional education session 2. Compare readiness for interprofessional learning between two health professions Method: Two private institutions, Western New England University College of Pharmacy (WNE CoP) and BayPath College, piloted a diabetes interprofessional education (IPE) program as a portion of each institutions curriculum. Twenty five physician assistant (PA) students joined 70 pharmacy students on the WNE campus for didactic and applied instruction. The diabetes portion was part of the Integrated Patient Care course for pharmacy students and the Clinical Medicine course for PA students. Classes took place over 7 days and included 12 hours of didactic instruction and 6 hours of applied learning. Students from both programs completed a pre- and post- Readiness for Interprofessional Learning Survey (RIPLS). Results: Eighty seven students completed the pre-survey (62 pharmacy, 25 PA). While both student groups responded positively to the importance and benefits of IPE in the pre-survey, PA students consistently rated their agreement to the benefits higher than pharmacy students. Seventy eight students (53 pharmacy, 25 PA) completed the post survey. Both groups rated their level of agreement to the importance and benefits of IPE lower after the IPE experience. PA students continued to rate their opinions higher than pharmacy students. Course evaluations revealed that while the IPE was generally a positive experience, there was some misunderstanding of the purpose and dissatisfaction with facility space. Implications: Proper facility planning needs to be undertaken prior to an IPE session. Introductory information and perhaps socialization should be provided to students prior to the IPE experience.

Interprofessional Education in a Pharmacology Course Using High Fidelity Simulation. Brittnay A. Meyer, South Dakota State University, Teresa M. Seefeldt, South Dakota State University, Lori Hendrickx, South Dakota State University College of Nursing, Paula Lubeck, Debra K. Farver, South Dakota State University, Jodi Re. Heins, South Dakota State University. Objectives: A pharmacology-focused high-fidelity simulation for pharmacy and nursing students was examined for feasibility and impact on understanding of pharmacology content and interprofessional communication. Method: Pharmacy (n=77) and nursing (n=69) students participated in a simulation on autonomic pharmacology using a SimMan 3G patient simulator in groups of 7-8 students. Following the simulation, faculty led a debriefing session to discuss the case and interprofessional collaboration. Students completed pre- and post-activity surveys immediately before and after the exercise to assess students’ perceptions of the activity and the impact on knowledge and interprofessionalism. Results: Students' perceptions of the activity were positive. Free responses revealed that students liked the simulation, with strengths including the multidisciplinary aspect, the realistic nature of the experience, and the opportunity to be in a team environment. Over 90% of the respondents felt the simulation increased their pharmacology knowledge and taught them how to apply pharmacology to patient cases. However, responses to the knowledge questions did not show a statistically significant difference for most questions; there was a decline in the percentage correct on one question, possibly due to the inclusion of “all of the above” as a correct answer. The data did not demonstrate a change in perceptions regarding interprofessionalism. Implications: This project demonstrated that a simulation in pharmacology is feasible, and students’ perceptions of the activity were positive. The impact of this type of simulation on knowledge and interprofessionalism requires further study including the structure of debriefing, the types of questions asked, and the timing of assessment.

Interprofessional Education in a Transitions of Care Experience. Carrie Vogler, Southern Illinois University Edwardsville, Jennifer D. Arnoldi, Southern Illinois University Edwardsville. Objectives: To describe the development and implementation of an interprofessional education experience with pharmacy and medical students performing transitions of care and evaluate its impact on students’ perceptions and confidence. Method: The interprofessional education opportunity consisted of a collaboration between pharmacists, fourth-year pharmacy
students, and third-year medical students. Pharmacists oversaw the combined effort of a pharmacy and medical student to provide discharge medication reconciliation and patient education in the inpatient setting. The impact of this experience was assessed by surveying the pharmacy and medical students at the beginning and end of each APPE or medicine clerkship rotation, respectively. The survey questions were adapted from the “Development of an Attitudes toward Health Care Teams Scale” and also included the opportunity for students to provide open feedback regarding the experience. Descriptive statistics including paired t-tests were used to analyze the data. Results: A total of 24 survey items and 6 written feedback questions about the transition of care experience were analyzed. Seven student pharmacists and 24 medical students completed the experience. Overall, pharmacy and medical students gave positive feedback about the experience and the data show students’ confidence in completing multiple aspects of care transitions increased after completing the experience. 

Implications: Medical and pharmacy students can learn from each other and increase their confidence when participating together in a discharge medication reconciliation experience.

**Interprofessional Flu Teams: A Look at Productivity.** Jeanie M. Smith, Harding University, Susan Winkler, Arkansas Department of Health. Objectives: Integrate student pharmacists into an interprofessional public health team to increase influenza vaccination doses administered and maintain productivity of the White County, Arkansas local health unit (WC-LHU). Method: In 2009, Healthworks, a health promotion program, Harding University College of Pharmacy (HUCOP) and the WC-LHU formed an interprofessional team to carry out the Governor’s directive to provide flu vaccine in schools. An affiliation agreement between HUCOP and the WC-LHU allowed fourth year student pharmacists to administer flu vaccine starting in 2012. Prior to 2012, student pharmacists provided clerical and structural support. Results: In 2012, the WC-LHU had to cease select clinic operations to staff flu clinics. In 2013, HUCOP support allowed the clinic to maintain productivity. In the 2012-2013 flu season, 5180 doses of influenza vaccine were administered; and in 2013-2014, 7120 doses were administered. Ideal productivity is identified as 12-15 patients per nurse per day and is trending downward. From November 2011 to November 2013, productivity dropped 2.4 patients per nurse per day, from 11.4 to 9 locally, and from 10.2 to 7.8 regionally. Without student pharmacist involvement in flu clinics, additional staff would be removed from the WC-LHU to support flu clinics, driving productivity even lower. Implications: Interprofessional partnerships advance public health initiatives like school flu clinics. This collaborative model may be replicated in other locations to support and carry out the Governor’s directive. Local health unit productivity will be maintained through this collaboration. Lastly, an excellent educational experience is provided in this student pharmacist/public health nurse collaborative.

**Interventions By Student Pharmacists via Electronic Stroke Rounds for Joint Commission National Quality Core Measures.** Amber M. Hutchison, Auburn University, Diana Wells, Auburn University, Phillip Lee, Auburn University. Objectives: Previous data have described interventions by student pharmacists in a variety of patient care settings; however, student participation in electronic stroke rounds to improve compliance with the Joint Commission National Quality Core Measures has not been evaluated. This study describes the interventions made by student pharmacists in an inpatient, community-hospital setting during an internal medicine Advanced Pharmacy Practice Experience (APPE). Method: As part of their APPE, student pharmacists participated in a multidisciplinary team focused on improving adherence to Core Measures in patients with stroke. Interventions were identified via electronic rounds, using secure email communication. Student pharmacists recorded interventions in a web-based documentation system and these interventions were reviewed retrospectively. Results: Over a twelve month period, 399 chart reviews were performed in 276 individual patients who presented with symptoms of stroke. Of these, 146 patients met criteria for Core Measure evaluation. Forty-four interventions were identified by student pharmacists. The most common intervention was initiation or adjustment of a statin medication, which occurred in 27 (18.5%) patients. Initiation or optimization of antithrombotic therapy occurred in 12 (8.2%) patients; these included at least four interventions with significant impact on patient safety (including drug interactions, contraindications, and inappropriate anticoagulation). Other interventions included antihypertensive therapy optimization, laboratory tests ordered, laboratory tests avoided, and patient counseling. Implications: Student pharmacist involvement in electronic stroke rounds may positively impact adherence to the Joint Commission National Quality Core Measures. This represents a unique opportunity to expand the role of APPE students in the hospital setting.

**Leadership Academy: An Approach to Cultivating the Next Generation of Pharmacy Leaders.** Carla Y. White, University of North Carolina at Chapel Hill, Jordan C. McNair, Michael Chargualaf, Claude Enoch, Megan Shah, Juhin Patel, Tomashu Jones, University of North Carolina at Chapel Hill. Objectives: To explore the impact of a Leadership Academy on leadership development prior to pharmacy school. Method: The Leadership Academy was implemented in 2011. The program is held once a month on a Saturday, during the spring semester of the academic year, and is geared toward leadership development for high school, college, and degree prospective students, interested in a career in the pharmaceutical sciences. The Academy is by invitation only to students who attended the Leadership and Excellence Development (LEAD) program, which allows students to explore careers in pharmacy. Each session of the Leadership Academy consists of: (1) Exposure to impactful speakers, (2) activities pertaining to a leadership topic, and (3) engagement with professional and student mentors. Results: Over the past two years, 124 participated in the Leadership Academy. Sixty were high school students and 64 were college and degree students. Thirty one Leadership Academy participants applied to pharmacy school and 29 were admitted. Two students obtained leadership positions within two years of admission. Ninety four percent of Leadership Academy participants believed that their interest in pharmacy school increased; 96% felt that they had gained skills and acquired knowledge to enhance their leadership skills. Implications: Opportunities for leadership development prior to enrollment in pharmacy school may serve as a platform to sustain interest in a career in the pharmaceutical sciences, facilitate mentorship and comfort in pursuing leadership opportunities in pharmacy school and beyond.

**Measuring Critical Thinking/Problem Solving Skills in Pharmacy Curriculum Using the Health Sciences Reasoning Test.** Catherine Cone, The University of New Mexico, Donald A. Godwin, The University of New Mexico, Rucha S. Bond, The University of New Mexico. Objectives: 1. To determine if correlations exist between year in pharmacy school and health Sciences Reasoning Test (HSRT) scores. 2. To determine if changes occur in aggregate after a critical thinking and problem solving (CT/PS) curricula is completed in pharmacy year 2. Method: All four years of pharmacy students in 2012 were administered the HSRT. A curriculum designed to teach students “how to” CT/PS was finished between the first and second year testing. The first
year class in 2012 was then followed into second year in 2013, thus
serving as their own control. Statistical analysis of the data was com-
pleted using an ANOVA and a two-tailed Student’s T-test. Results: HSRT scores by year in pharmacy school Year(n) First(85)Second(83) Third(80)Fourth (42) Overall 20.2 21.8* 21.9 22.2 Percentile 43 54* 53 56 Control and Intervention Group Year(n) First (85) Second (81) Overall 20.2 22.0* Percentile 43 55* *P < 0.05 Implications: Our students improved their CT/PS skills significantly as measured by the HSRT after receiving the CT/PS curriculum. They started below the mean in CT/PS compared to other pharmacy students across the country, but improved to above the mean in a relatively short period of time. New Mexico is a comparatively poor, rural state in which the public school system ranks low nationally. In other states with similar chal-
lenes, colleges of pharmacy might benefit from seeing the progress that UNM COP students made on the HSRT and the curriculum that contributed to the improved scores.

Meeting American Academy of Pediatrics Requirements for Elec-
tronic Prescribing in Children: A Pilot Study. Michelle E. Condren, The University of Oklahoma, Christine Hughes, The University of Oklahoma, Brooke L. Honey, The University of Oklahoma. Objectives: The objectives of this pilot study were to develop a process for assessing electronic health records (EHR) for their ability to meet the American Academy of Pediatrics (AAP) requirements for safe and effective e-prescribing in children and to determine if prescribing errors could be decreased by these requirements. Method: Investigators met with clinic personnel to discuss EHR specifics and methods for assessing system capabilities. Scenarios for prescription ordering were used to determine the presence or absence of the AAP require-
ments. All prescriptions written in June-July 2013 were reviewed for errors by a pharmacy student and 2 pharmacists. Errors were catego-
rized as being preventable or not based on AAP requirements. Results: The EHR was found to meet 4 of 19 criteria. Four criteria were partially met. One example highlights that weight-based dosing calculations were possible; however not all calculations were accurate and a final dose in milliliters was not consistently provided. Of the 351 prescriptions reviewed, 43 (12.3%) contained an error. If the system contained AAP requirements of indication-based dosing, dose recommendations, dose range checking, and medication-specific indications, 22 errors (51.1%) could have been avoided. If a custom medication list were created, 30 errors (70%) could have been avoided. Combined, this could have prevented 38 (88%) errors. Implications: A process for analyzing the EHR was developed. This process will be valuable in assessing additional EHR systems. While inclusion of AAP require-
ments for prescribing could help avoid some errors, additional inter-
ventions will be needed to further reduce prescribing errors in pediatrics.

National Curriculum Survey Addressing Nonprescription Med-
cines in US Schools/Colleges of Pharmacy. Emily M. Ambizas, St. John’s University, Karen MS Bastianelli, University of Minnesota, Stefanie P. Ferreri, University of North Carolina at Chapel Hill, Schwanda K. Flowers, University of Arkansas for Medical Sciences, Seena L. Haines, Palm Beach Atlantic University, Katherine K. Orr, The University of Rhode Island, Karen S. Pater, University of Pitts-
burgh, Misty M. Stutz, Sullivan University, Timothy R. Ulbrich, Northeast Ohio Medical University, Jenny A. Van Amburgh, North-
eastern University, Miranda J. Wilhelm, Southern Illinois University Edwardsville. Objectives: To provide pharmacy educators with a na-
tional perspective on the status of nonprescription medicine education in Doctor of Pharmacy curricula and to compare results between 2009 and 2013. Method: The questionnaire utilized in 2009 was updated to

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Outcomes of a Structured Career Mentoring Program. Cathy L. Worrall, South Carolina College of Pharmacy. Amy D. Grant, South Carolina College of Pharmacy. Objectives: Desired program outcomes included increasing students’ awareness of pharmacy career opportunities, helping students explore potential career paths, facilitating students’ career decision-making, and enabling networking opportunities with potential employers. Method: During the 2012-13 academic year all P1-P3 students in the South Carolina College of Pharmacy were required to complete the APhA Career Pathway Evaluation Program (CPEP) self-assessment and participate in six career exploration activities. Program compliance was assessed through interim and annual reflection papers. Faculty, preceptors and alumni volunteered to serve as career mentors. They were categorized using APhA’s CPEP career option categories. Students and mentors were administered surveys via Survey Monkey at the end of the academic year to assess program outcomes and obtain program feedback. Results: 575 students and 121 mentors completed the surveys. Students agreed/strongly agreed that the program increased their awareness of pharmacy career opportunities (72%), the self-assessment helped them target potential career paths (40%), the program helped facilitate their career decision-making (46%) and helped them network with potential employers (42%). Students and mentors agreed/strongly agreed that the program requirements and time commitment to participate in the program were reasonable (70% and 69%, respectively). Mentors indicated interest in continuing to participate in the program (96%) and expanding their role in the program (74%). Implications: This program exposed students to pharmacy career opportunities and facilitated networking with potential employers early in the curriculum. As the program evolves it may guide students in their selection of elective courses, advanced pharmacy practice experiences, and ultimately job placements.

P3 Pharmacy Students’ Perceptions on Transitions of Care (TOC): Before and After a TOC Course. Diane Hadley, University of the Sciences, Sanchita Sen, University of the Sciences, Stacy Elder, University of the Sciences, Radha V. Patel. Objectives: In Fall 2013, a TOC elective course was implemented for third year PharmD students (P3) at PCP. The course covered concepts including TOC regulatory policies, TOC model development, health literacy, interprofessional education (IPE) and barriers to TOC implementation. The objective of this study was to describe students’ perceptions about TOC through pre- and post-course surveys. Method: The twelve enrolled students received an anonymous paper survey during the first and last week of the course. It included questions to assess perceptions regarding various TOC elements and pharmacists’ roles within the TOC process. The survey was constructed using Likert scale and multi-answer formats. Students were informed of the study objective prior to providing consent. USciences IRB approved this protocol. Results: The survey achieved a 100% response rate. When asked if they felt they could define TOC, “strongly agree” responses increased to 12/12 (100%) from 1/12 (8%). In regards to understanding the necessity of pharmacist involvement in the TOC team, student response of “strongly agree” increased to 12/12 (100%) from 1/12 (8%). In the post-course survey, 10/12 (83%) of the students strongly agreed they could identify five TOC activities pharmacists could perform compared to 0% in the pre-course survey. Additionally, positive impact was noted for the students’ perceptions on various other TOC elements including medication reconciliation, health literacy, and IPE in the post-course survey. Implications: P3 PharmD students’ perceptions about TOC were positively impacted by participation in a novel TOC elective course.

PGY1 Pharmacy Residency Program Perceptions of Minimal Baseline Expectations for Residents. Anne G. LaDisa, Concordia University Wisconsin, Andrew P. Traynor, Concordia University Wisconsin. Objectives: Post-graduate Year 1 (PGY1) Pharmacy residency programs have minimum baseline expectations (MBEs) for knowledge and skill obtained before residency. The objectives of this project were to identify: 1) residency program minimal baseline expectations (MBEs), 2) perceptions of residents’ abilities to meet MBEs, and 3) implications of not meeting MBEs. Method: Residency program directors (RPDs) of PGY1 Pharmacy programs were invited to complete an electronic survey. Respondents identified learning goals, derived from accreditation standards and the 2013 Center for the Advancement of Pharmacy Education (CAPE) educational outcomes, their programs perceive as having MBEs for resident performance. Respondents estimated what percentage of residents in their program from 2011-2013 met MBEs. Respondents indicated implications of residents not meeting MBEs. Results: A response rate of 38.2% was achieved. PGY1 Pharmacy RPDs identified professional learning goals as most common (ranging from 95-98%) for having MBEs. Learning goals related to implementing changes to an organization’s medication use system (42%) and navigating an organization’s political and decision-making structure (42%) were least common to have MBEs. Residents have most often failed to meet MBEs in formulating a practice-related residency project study design (15%). The most common implications of not meeting MBEs include delivery of customized instruction (72%), increased preceptor and staff workload (52%), and rotation schedule changes (43%). Implications: Identifying MBEs for pharmacists entering residency programs may guide curricular planning, especially in courses to prepare students for residency. RPD’s assessment of MBEs of residents provides feedback on the need for focus on the 2013 CAPE outcomes.

Pediatric Education across US Pharmacy Schools: What is being taught and how? William A. Prescott, University at Buffalo, The State University of New York, Elizabeth Dahl, University at Buffalo, The University of Oklahoma. Objectives: This study identified the proportion of prescribed liquid medications that can be properly administered with devices available at local pharmacies. Method: Investigators selected five pharmacies within a five mile radius of the pediatric clinic. All clinic prescriptions over a two-month time frame were analyzed. Devices from the pharmacies were compared with the prescriptions to determine if they were appropriate. Data collected for each prescription included: presence of markings on the device at the prescribed dose, if the units of measurement matched the device, if appropriate to measure the prescribed volume with given syringe, optimal syringe volume, and if the pharmacy had an appropriate device for the prescribed volume. Results: Pharmacies carried a mean of 2.2 oral medication delivery devices (range:1-4). All carried the 5-mL syringe, 80% stocked a 10-mL device, and one pharmacy carried either a 1-mL or 3-mL syringe. Over the two-months of prescriptions analyzed, 557 prescriptions were written with 158 (28%) being liquids. Comparing the unique devices to prescriptions independently, it was found that appropriateness was 10%, 28%, 36%, and 65%, respectively for the 1-mL, 3-mL, 5-mL, and 10-mL devices. The 5-mL syringe was optimal in 22% of prescriptions and the 10-mL syringe was found to be most optimal when compared to all prescriptions. Implications: Oral medication delivery devices are imperative for safe and effective oral liquid medication use. The most commonly available 5-mL syringe was found to be inappropriate for the majority of prescriptions. Understanding optimal and appropriate devices will allow pharmacists to tailor patient-specific education.

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Objectives: To determine the extent pediatrics is taught at US PharmD programs and to characterize what is being taught and how.

Method: A 40-question online survey was sent to accredited and candidate status US PharmD programs. Results were compared to the 2005 Pediatric curricula recommendations published by the Pediatric Practice and Research Network of the American College of Clinical Pharmacy (ACCP).

Results: A total of 86/128 programs responded to the survey (67.2% response rate). Demographics of responding programs were similar to US PharmD programs as a whole. Eighty-one programs (94.2%) indicated pediatric topics were included within their required didactic curriculum (mean = 21.9 contact-hours, median = 16 contact-hours). Approximately three-quarters of programs did not meet the 25 contact-hour standard set by ACCP. A stand-alone pediatric elective was offered by 61.0% of programs (mean = 25.9 contact-hours, median = 29 contact-hours). Pediatric-focused advanced pharmacy practice experiences (APPE) were offered by 97.4% of programs, with an average of 27 students per program completing a pediatric-focused APPE annually. Lecture and case-based learning were the most commonly used instructional methods. Implications: Almost all responding programs incorporated pediatrics within the required didactic curricula, but most did not meet ACCP standards. Stand-alone pediatric elective courses were common, and when offered, provided an adequate number of contact-hours. Almost all responding programs offered a pediatric-focused APPE, but due to the limited quantity of these experiences, only one-fifth of students completed one prior to graduation. Continued expansion of pediatric-focused didactic and experiential curricula across US PharmD programs is recommended to meet ACCP recommendations.

Pharmacy Practice Student Research Fellowships: Outcomes and Benefits of Women’s Health Projects. Denise Ragland, University of Arkansas for Medical Sciences, Nalin Payakachat, University of Arkansas for Medical Sciences.

Objectives: A Pharmacy Practice Student Research Fellowship is a 10-week program offered to student pharmacists interested in gaining research experience. This report summarizes the outcomes and benefits of women’s health fellowship projects conducted in the past 7 years.

Method: Student pharmacists apply to the program offered between the spring and fall semesters. Students are matched with faculty mentors after a competitive interview process and submission of preferences by both the students and mentors. Students who complete their projects, present the results at professional meetings, and draft manuscripts can apply to graduate with Honors in Research. The fellowships are supported by State funds allocated by the Dean for faculty development and student leadership.

Results: Since 2007, eight students who received fellowships opted to work on women’s health projects. These projects produced 9 posters, 72 manuscripts (5 published, 1 in review, and 1 in development). Fellowship projects addressed depression screenings in pregnancy, appropriate contraception use, health literacy assessments in pregnancy, and emergency contraception counseling. Students benefitted from practicing counseling skills and the acquisition of research skills including consenting subjects, survey methods, data collection and management, poster presentation and manuscript preparation. The fellowships benefitted faculty mentors by providing help with scholarly activities. Patients also benefitted from the screenings and learning activities associated with patient education on exercise in pregnancy. Appropriate contraception use, health literacy assessments in pregnancy, and emergency contraception counseling. Students benefitted from practicing counseling skills and the acquisition of research skills including consenting subjects, survey methods, data collection and management, poster presentation and manuscript preparation. The fellowships benefitted faculty mentors by providing help with scholarly activities. Patients also benefitted from the screenings and learning activities associated with patient education on exercise in pregnancy. Implications: Pharmacy Practice Research Fellowships offer great opportunities to both students and faculty to engage in research while establishing the role of pharmacists in women’s health care.

Pharmacy Student Awareness and Knowledge of the Prescription Drug Monitoring Program in Texas. Santhi Masilamani, University of Houston, Marc L. Fleming, University of Houston, Nipun Atreja, University of Houston.

Objectives: Future pharmacists must face practicing in an environment characterized by an epidemic of prescription drug abuse. A Prescription drug monitoring program (PDMP) is one useful tool available to pharmacists to identify drug diversion and abuse. The purpose of this study was to assess pharmacy student awareness and knowledge of the recently launched Texas PDMP.

Method: A cross-sectional online questionnaire consisting of 18 items was administered to pharmacy students at the University of Houston (P2, P3 and P4). First year pharmacy students were excluded due to lack of school based experientials. Awareness and knowledge of the program, enrollment, and enforcement, were assessed. Descriptive statistics were conducted for all variables. Chi-square analysis was used to examine differences by professional year. The a priori level of significance was set at $P < .05$

Results: Of the 324 students that responded to the questionnaire, only 33% reported PDMP awareness. A statistically significant difference was found in awareness by professional year, $\chi^2 (2, N=112) = 16.7, P<.001$. Of the aware respondents, most werefemale (61%), older than 23 (69%) and P4s (42%). Also, 49% knew the administering agency, 48% did not know if pharmacy technicians were allowed access and only 36% knew the name of the PDMP. Technician experience in the community pharmacy was the most cited source for knowledge. Only 38% reported past exposure to a PDMP patient report

Implications: PDMP education has not been incorporated into the pharmacy curriculum in Texas. Based on results of this survey, pharmacy programs should consider PDMP education.

Pharmacy Students’ Exercise Habits and Perceptions of Exercise Counseling. Anastasia L. Hoover, Purdue University, Jane E. Krause, Purdue University.

Objectives: Healthy People 2020 includes goals for both physical activity and weight loss. Although these objectives name physicians, pharmacists can also contribute to the attainment of these goals. This study assessed exercise habits and perceptions of exercise counseling of pharmacy students.

Method: First, second, and third professional year Doctor of Pharmacy students’ perceptions were assessed using a 25 item questionnaire utilizing a five-point Likert scale [strongly agree (5); strongly disagree (1)]. Six short answer and demographic questions (gender, year in program) were included. Descriptive statistics were used to report the results of each item. Associations based on demographics were analyzed using the Kruskal-Wallis test. Results: A total of 423 students participated (93.4% response rate). First, second, and third professional year students, respectively, agreed or strongly agreed that they actively incorporate exercise into their schedule (70.7%, 75.4%, and 85.7%), felt confident in counseling patients about exercise and weight management (42.7%, 61.1%, and 75.3%), had observed a pharmacist counseling a patient about incorporating exercise into his or her lifestyle (20.0%, 21.4%, and 22.5%), and that obesity is a disease (74.0%, 88.8%, and 82.3%). Associations were primarily found with year in the academic program. Implications: This project allowed for the general exploration of pharmacy students’ exercise habits and perceptions of exercise counseling. Gaining this understanding guides faculty to strengthen teaching and learning activities associated with patient education on exercise in conjunction with other health care professionals.

Pharmacy’s Emerging Leaders: Measuring and Identifying Predictors of Student Leadership Potential. Carla Y. White, University of North Carolina at Chapel Hill, Brittney Louis, University of North Carolina at Chapel Hill, Tomashu Jones, University of North Carolina at Chapel Hill.

Objectives: To examine multiple variables that may
have a role in predicting leadership potential prior to admission to Pharmacy School. **Method:** A study was conducted, involving current and former PharmD Students who held leadership positions in 23 student organizations, and included the utilization of student records from 2009-2012, which reflected a cohort of 313. Variables included gender race, in and out of state residency, prior institution type, GPA/PCAT scores, major, degree status, and frequency of leadership. A “Leadership Score” was calculated to measure leadership potential. Elected positions received a higher allocation of points to recognize more formalized leadership roles. **Results:** Females (1.72) had slightly higher average leadership scores compared to males (1.67). Race and residency status scores were comparable. The average GPA was 3.5 and average PCAT composite scores for those with MS, BS, and BA degrees and no degree were similar at 87, 85, 84, and 83, respectively. However, individuals with associate degrees had significantly lower composite scores (68). Biology, quantitative and reading PCAT Scores (p < .01) indicated a correlation with leadership. Those that attended private institutions revealed the highest average leadership scores (1.85) in contrast to 4 year public institutions (1.65) and community colleges (1.42). **Implications:** This study indicates that the strongest predictors of leadership include individuals who perform at high academic levels from diverse backgrounds, with a broad range of educational attainment, and those that attended Ivy League institutions. Information from this study may inform future admissions practices to recruit and admit the next generation of pharmacy leaders.

**Predictors of performance on the Pharmacy Curriculum Outcomes Assessment (PCOA).** Christopher A. Giuliani, Wayne State University, Justine S. Gortney, Wayne State University, Juliann Binienda, Wayne State University. **Objectives:** The Accreditation Council for Pharmacy Education (ACPE) encourages summative evaluations of students. The Pharmacy Curriculum Outcomes Assessment (PCOA) is a measure of knowledge in pharmacy educational programs. No studies have evaluated factors that predict student performance on the PCOA. Therefore, our aim was to determine whether student variables consisting of learning style, admission GPA, P1 and P2 GPA, and composite PCAT score would predict performance on the PCOA. **Method:** An analysis of P2 PCOA scores, and other predictor variables was conducted. Data was collected during a learning style workshop using the Unified Learning Style Model and through institutional databases. Multivariate analyses with a stepwise linear regression were used to measure likely predictors identified in the literature. **Results:** 96 students completed the PCOA examination and 88 students participated in a learning styles workshop. In the univariate analysis positive predictors included baseline GPA, composite PCAT score, P1 GPA, P2 GPA, and learning styles (reflective, preferred reading, and introvert). P1 GPA, composite PCAT score, and introvert remained significant in the final model. For each 1-point increase in P1 GPA and composite PCAT score, PCOA scores (maximum score 700) increased on average by 40.6 and 0.9, respectively. PCOA scores of introverted students demonstrated an average increase of 19.2. **Implications:** Our pilot study mirrored summative assessment predictors in health education, however we also found an association between introversion and performance on PCOA. These findings could be used to enhance curricular development and inform efforts to enhance student success.

**Promoting Active Learning with Problem-based Learning (PBL) in a Flipped Classroom Format for Pharmacy Jurisprudence.** Maree C. Michaud-Sacks, Albany College of Pharmacy and Health Sciences, Debra Feinberg, Albany College of Pharmacy and Health Sciences, Yuzhu Teng, Albany College of Pharmacy and Health Sciences. **Objectives:** Jurisprudence faculty and Instructional Design Services collaborated to redesign the NYS Controlled Substance lesson for the 2013 course offering. This topic is particularly difficult and has great importance, as students must know how to apply the law properly to avoid legal repercussions. The design goal was to enable students to apply controlled substance law to situations they may encounter in practice. The objective of this research was to examine the effectiveness and perceptions surrounding the redesigned lesson, by analyzing quantitative and qualitative data collected. **Method:** A flipped classroom format was designed to accommodate active learning during class. Active learning strategies such as pre-class homework and problem-based assignments assisted students in developing the necessary skills and knowledge for this topic. Course data from 2012 and 2013 was analyzed using a t-test to discover the effect on achievement. A survey and focus group interviews were conducted to collect student perceptions of the new format and activities. **Results:** In comparing the quiz results from 2012-2013, increases were seen in the overall scores, for the same or very similar questions, and for knowledge and application questions. T-tests were used to determine that the positive increases were statistically significant (p < 0.0001). Student surveys indicated that 78% of students felt they gained a better understanding of the topics through completing the activities and 76% of students felt more confident in practicing pharmacy according to the law. **Implications:** Utilizing a flipped classroom format with PBL positively impacts student performance and perceptions of learning for a pharmacy jurisprudence course.

**Public Service Announcements to Facilitate Dietary Supplement Education.** Sydney P. Springer, Anne L. Hume, The University of Rhode Island, Katherine K. Orr, The University of Rhode Island. **Objectives:** To implement and assess a revised Public Service Announcement (PSA) project in a required Self Care course. **Method:** In 2012, students completed a PSA project as part of team-based learning activity. In 2013, both PSA audience and topics were revised to be more specific and applicable to current trends. A rubric standardized grading and each student was responsible for an individual project consisting of a 1-page summary on DS marketing examples, monographs, disease specific counseling, or audience-specific counseling points. Students completed an anonymous IRB approved survey assessing the format, individual project, and use of pharmacy resources. **Results:** Seventy-four of 123 surveys were completed. Of the students who responded, 86.5% agreed that the PSA activity enhanced understanding of DS and 85.2% agreed that group members contributed equally to the project. Three quarters agreed that the PSA project was a worthwhile experience. Only 44.6% of students agreed that the individual assignment helped them create a better PSA. Over 90% of students agreed that they used multiple resources on their individual project with over two-thirds reporting they agreed that they learned to better use pharmacy resources. Only 47.3% agreed the individual project was a worthwhile experience. Watching PSAs in class helped students better learn about DS and made them feel more engaged in class. **Implications:** The addition of an individual project made students more prepared to create the PSA. Although a small percentage felt the individual project was not worthwhile, most agreed the overall PSA project enhanced their understanding of dietary supplements.

**Public Health, Health Promotion, and Disease Prevention Courses in Some Asian Pharmacy Programs.** Mohammed A. Islam, West Coast University, Simi Gunaseelan, West Coast University, Seher A. Khan, Lake Erie College of Osteopathic Medicine, Rahmat M. Talukder, West Coast University. **Objectives:** To identify and assess the breadth and depth of public health, health promotion, and disease

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prevention courses in pharmacy curricula of five Asian countries.

Method: The electronic databases Medline/PubMed and Google Scholar were searched for articles published on the Asian pharmacy education and public health. Additionally, the websites of pharmacy education accreditation agencies and individual pharmacy program were visited; information retrieved, and evaluated. In addition, program brochures and course syllabi were obtained and reviewed. Results: Website search of pharmacy programs unveiled offerings of some public health related contents such as immunization, nutrition, family planning, rational use of drugs, pharmacovigilance, and disease prevention embedded in different courses in the pharmacy curricula of India (n = 143), Pakistan (n = 33), and Bangladesh (n = 14). However, there are no published studies pertaining to need analysis and incorporation of public health courses in pharmacy curricula of these countries. In contrast, some institutions of Thailand (n = 2) and Malaysia (n = 12) are offering public health courses in much greater detail (2-10 semester credits). Moreover, activity-based learning strategies such as academic debate, projects, poster session, journal club, providing health information and counseling to the public, nursing home visits, and CPR training have been identified in the curricula of a few pharmacy schools in these two countries. Implications: This study identifies gaps in adopting public health related courses in pharmacy curricula of Asia. Incorporation of core courses on public health along with integrated health promotion activities into the curriculum will provide basic competencies and skills for future pharmacists in public health.

Qualitative Analysis of Residency Directors’ and Pharmacy Faculty Members’ Interview Responses Regarding Residency Candidate Selection Criteria. Jacob P. Gettig, Midwestern University/Downers Grove, Elizabeth W. Blake, South Carolina College of Pharmacy, Daniel L. Friesner, North Dakota State University, Emily R. Hajjar, Thomas Jefferson University, Elmer J. Gentry, Chicago State University, Jonathan M. Kline, West Virginia University. Objectives: The purpose of this study was to examine opinions of PGY1 residency directors and pharmacy faculty members regarding residency selection criteria. Method: PGY1 residency directors and pharmacy practice faculty members of AACP were randomly selected. Selected individuals were emailed study information and were given an opportunity to consent to a 30-minute telephone interview. The interview consisted of 10 open-ended questions about previously identified residency selection criteria (e.g., GPA, leadership, “fit”). Responses were transcribed into SurveyMonkey® and eventually extracted into Excel® for qualitative analysis. Researchers examined transcripts for themes and nuanced responses and sought consensus in theme analysis as needed. Results: Eighteen participants completed the interview – 8 residency directors, 7 faculty members, and 3 who served in both roles. Most participants said GPA was an important residency selection criterion and some said it should be considered with other activities to determine if a candidate is well-balanced. Most participants stated the well-written and specific letters of recommendation and knowing an applicant through a previous experience have potential to positively or negatively influence residency candidate selection. Responses diverged more with respect to each participant’s definition of “fit” and the relative importance of the candidate’s alma mater and work, research or extracurricular/leadership experience. There did not appear to be any stark differences in response themes between residency directors and pharmacy faculty. Implications: Qualitative analysis of interviews allowed a deeper understanding of residency directors’ and faculty members’ definitions of, predispositions toward, or biases against a variety of commonly studied residency selection criteria.

Refining a Blended Pharmacotherapy Module: Lessons Learned Along the Way. Maree C. Michaud-Sacks, Albany College of Pharmacy and Health Sciences, Jennifer Cerulli, Albany College of Pharmacy and Health Sciences, Emily Leppien, Albany College of Pharmacy and Health Sciences. Objectives: In 2013, Pharmacy Practice and Instructional Design Services revised a 1-credit, required pharmacotherapy respiratory course for 213 students on 2 campuses using the ADDIE model. Redesign goals, based upon 2012 data, included: help students become self-regulated learners, improve design of the course site, improve student-instructor connection/communication, and increase the quality/quantity of formative assessments. The objective was to measure the effect of the redesign on achievement and student perceptions, using quantitative/qualitative methods (formative/summative assessments, survey, focus group). Method: To help students self-regulate and improve student-faculty connectivity, elements were added to the LMS (audio/video recordings, reminders), and course components were restructured. Formative assessments were added (softchalk medication knowledge) or revised (student-written exam question rubric, google-doc cases). Student perceptions from a 10-question anonymous survey (8 Likert-scale, 2 open-ended) and focus group interview were analyzed. Course assessments (formative/summative) were analyzed (T-test) to determine the effect on achievement. Results: Student surveys revealed 79% agreed/strongly agreed the module structure and timeline improved time-management. 86% agreed/strongly agreed learning activities allowed course progress review. Students expressed in the focus group that they felt comfortable asking questions online, but preferred to connect with the instructor during face-to-face class time. Formative assessments (Pre-test/Practice/Post-test) improved throughout the semester. Final exam and course grades were unchanged from 2012-2013. Qualitative assessment showed student perceptions of the redesign were mostly positive. Implications: The redesigned course addressed prior student concerns, and was positively received by students. Formative assessment outcomes improved throughout the semester. Lessons learned from this redesign will help educators design blended courses.

Relationship Between PCOA Performance and Course Performance. Justine S. Gortney, Wayne State University, Christopher A. Giuliano, Wayne State University, Richard L. Slaughter, Wayne State University, Francine D. Salinitri, Wayne State University. Objectives: To determine if a relationship exists between PCOA score and course work performance in a pharmacy curriculum. Method: The PCOA was administered to all P2 students. Due to PCOA administration dates, data were most reflective of P1 coursework. A map of course content was made to PCOA domains and subtopics. Data gathered included GPA for P1 and P2 years; PCOA scores including overall, domains, and subtopics; and student course grades in the P1 curriculum. Data were evaluated using descriptive statistics and Pearson correlation. Results: Eighty-five student records were evaluated. Both P1 and P2 GPA had a moderate relationship with PCOA score (r = 0.54,0.51, p<0.01). Courses mapping to the Basic Biomedical Sciences Domain (5) had moderate relationships with PCOA score (r = 0.44-0.46, p<0.01) and those to Pharmaceutical Sciences (2) had low correlations (r = 0.21,0.34, p = 0.01,0.06). Courses (3) mapped to either Social/Behavioral/Administrative (SBA) or Clinical Sciences that incorporated primarily knowledge-based assessments and focused on law or informatics had moderate relationships with PCOA scores (r = 0.40-0.52, p<0.01). Courses (4) that had broad, introductory pharmacy content or were skills based had no relationship to PCOA scores (r = 0.09-0.19; p = NS). Implications: PCOA exam performance had a positive and significant, moderate relationship to GPA, coursework
Required Textbooks: are Students Buying and Reading Them? Corey D. Robinson, Lauren S. Schleselman, University of Connecticut. Objectives: Either as pre-lecture background material or as supplemental information, faculty often assign textbook chapters, articles, or other material to students as out-of-class readings. Faculty assume that the required textbooks are not only purchased but read as assigned. The objectives of this study were 1) to determine if students are purchasing required & recommended textbooks, 2) to determine if students are completing assigned readings, and 3) to determine student expense for textbooks. Method: Utilizing syllabi, a list of required and recommended textbooks was compiled for each professional year. P1-P3 students were surveyed to determine which books were purchased and from where and if they did the readings. Results: If students bought all required and recommended textbooks, it would cost more than $1100 per student. Only 3 books were purchased by more than half the students: Handbook of Nonprescription Drugs, Nonprescription drug cards and APhA’s Peripheral Brain for the Pharmacist. More than half of students purchased books through Amazon. The greatest factors influencing the decision to purchase were cost, if readings were actually assigned, and what previous students recommended. Implications: Due to cost and other factors, students are not routinely purchasing textbooks. Results were used to facilitate faculty discussions to consolidate the list of textbooks and increase the application of reading assignments.

Resources Used by Faculty Members to Develop Leadership Mindsets and Transition into Academic Administrator positions. David G. Fuentes, Manchester University College of Pharmacy, Shareen El-Ibiary, Midwestern University/Glendale, Scott S. Wisneski, Northeast Ohio Medical University, David F. McFadden, Manchester University College of Pharmacy. Objectives: To (1) describe leadership and development resources used by faculty members as they transition into administrative roles, (2) identify leadership and development resources used by faculty leaders in non-administrative roles, and (3) illustrate intersections between a variety of leadership/management skill sets and approaches to mentorship. Method: A 10-item survey was developed and deployed to all program deans seeking permission to survey their administrative and non-administrative faculty and endorsement from the Office of Dean, or the Dean’s representative. Members of the current cohort of the Academic Leadership Fellows Program were individually invited to participate. Results: Faculty members and administrators (n = 136) representing 64 pharmacy programs responded. Those with associate professor rank responded most. Skill sets in which respondents reported needing the most development included conflict management, motivating colleagues, budgeting and delegating. These were consistent with skills ranked as very important, including promoting life balance, team building, change leadership, and strategic planning experience. The most common sources of development experiences came from serving on institutional committees, actively seeking new assignments and being given opportunities directly by a mentor. Informal conversations, most commonly occurring monthly, were the most frequent resource reported. Implications: Perceptions and acknowledgement of the importance of skills related to leadership and managerial roles, opinions of the value of mentorship, prior exposure to service opportunities, and the connectedness to a mentor and useful networks may forecast success as a current and future administrator. Further investigation in this area may identify formulas for success to benefit those looking to serve in academic leadership roles.

Role Perceptions Following Interprofessional Patient Counseling Workshop. Kirsten B. Balano, University of California, San Francisco, JoAnne Saxe, University of California, San Francisco School of Nursing, Midori Nakajima, University of California, San Francisco School of Nursing, Tina Brock, University of California, San Francisco. Objectives: To determine the impact of interprofessional learning upon advanced practice nursing (APN) and clinical pharmacy (CP) role perceptions regarding patient counseling activities. Method: Nursing and pharmacy faculty at UCSF created a full-day interprofessional workshop for APN and 3rd year CP students to develop their patient counseling skills. Learners responded to a pre and post workshop survey asking learners to rank the importance of APNs and CPs participation in the following patient counseling activities: Medical History Taking (MHT), Medication Reconciliation (MR), Discharge Planning (DP), Medication Adherence Counseling (MAC), Substance Use Counseling (SUC), Diet/Exercise Counseling (DEC), Sexual Risk Reduction Counseling (SRRC), Self-Care Planning (SCP) and Tobacco Cessation Counseling (TCC). Results: 200 learners completed the Pre-Workshop survey (57% APN and 43% CP). 164 learners completed the Post-Workshop survey (57% APN and 43% CP). Pre-workshop, APN and CP learners had significant differences in role perception regarding the importance of APN participation in all of the patient counseling activities (p<0.01) while their perception regarding the importance of CP was different in MHT (p=0.02) SUC, DEC, SRRC, SCP and TCC (p<0.01) with no statistical difference in MR, DP and MAC. Post-workshop, learners’ role perceptions regarding importance of APN participation in DP, SUC, DEC, SRRC and SCP were not significantly different. Post-workshop role perceptions of the importance of CP to participate in MR, DP, MAC remained similar, and there was improved alignment in SRRC and TCC. Implications: Interprofessional patient counseling workshops have a significant impact on APN and CP learners’ role perceptions which may enhance team-based patient care.

Rubric Reliability in Evaluating Oral Case-based Presentations in a Drug-Induced Diseases Elective. Meredith L. Howard, Sarah Nisly, Butler University, Alison Walton, Butler University, Alex N. Isaacs, IU Health. Objectives: To assess the reliability of a standardized rubric to evaluate an oral case-based presentation in a professional pharmacy elective. Method: Students in their third professional year preparing in a Drug-Induced Diseases elective course completed three oral case-based presentation examinations during the semester. A comprehensive rubric was created for assessment and evaluation of each group presentation. The rubric evaluated the performance of each group of two students on the creation and delivery of a drug-induced disease patient case in the areas of originality, depth of problem, problem solution, references, and presentation. Each student group was independently evaluated by three faculty members, utilizing the standardized rubric. This study evaluated the reliability amongst faculty evaluators. Correlation coefficients for interrater reliability were determined using a one-way random intraclass correlation. Results: Fourteen students, enrolled in the Drug-Induced Diseases elective, completed the three exams. Twenty-one rubric scores were tested for reliability. The intraclass correlation coefficient for overall exam scores amongst the evaluators was 0.59, p-value = 0.006. When evaluated separately, the individual rubric categories of originality and problem solution demonstrated reliability (p<0.05). The individual
Standardized Patient Evaluation of Student Blood Pressure Technique in a Physical Assessment Course. Carrie Vogler, Southern Illinois University Edwardsville, Katelyn Mitchell, Southern Illinois University, Edwardsville, Audrey Pruemer, CVS Pharmacy. Objectives: To determine how different groups of standardized patients (SPs) assess blood pressure technique compared to faculty evaluators. Method: Data was collected during three separate lab practicums for the Physical Assessment course at Southern Illinois University of Edwardsville School of Pharmacy. During the lab practicum, the second professional year pharmacy students conducted a brief interview and checked the patient’s blood pressure and heart rate. A checklist regarding placement of blood pressure cuff, support and position of patient’s arm, deflation rate, announcement of blood pressure and heart rate, etc. was used to assess the student’s technique. These criteria were assessed by both the SP and the faculty evaluator and compared to determine the accuracy of the SP evaluations. Three unique SP groups made up of fourth professional year pharmacy students, drama students, and people from the general community were also compared to see if specific SP groups assessed the students differently. All SPs received the same training. Results: The results from 34 SPs and 18 faculty evaluators showed that blood pressure cuff deflation rate had the highest variance between the faculty evaluators and the SPs (fourth professional year pharmacy students 13.5% and drama students 23.4%), while the results for the other criteria were not statistically significant. Overall, SPs gave the same credit as evaluators 95.2% of the time. The results between the different SP groups will be presented at the AACP meeting. Implications: SPs can assume the role of patient and evaluator for blood pressure evaluation when provided with the proper training.

Statewide Assessment of the Effects of Pharmacist Personality Type on Practice Area and Job Satisfaction. Whitney Maxwell, South Carolina College of Pharmacy, Amy D. Grant, South Carolina College of Pharmacy, Marie Cavalier, South Carolina College of Pharmacy, Kevin Lu, South Carolina College of Pharmacy. Objectives: The objective of this study is to determine if an association exists between pharmacist personality type, job satisfaction, and practice area in a statewide assessment of pharmacists. Method: Following IRB approval, 491 pharmacy preceptors received an 11 question electronic survey to determine participants’ demographics, first and current pharmacy practice areas, and job satisfaction using a Likert scale. Participants were also required to complete the online Humanmetrics Jung Typology Test™, which reports sixteen different personality types. Results: Sixty-five percent of study respondents were female and 56% were between ages 22-40. Most respondents practiced as clinical pharmacists (36%) and hospital pharmacists (26%). Other respondents practiced in community (22%) or administrative settings
Student Attitudes Toward the Use of Technology for Instruction in an Infectious Diseases Elective Course. Bhavik M. Shah, Jefferson School of Pharmacy, Jason J. Schafer, Jefferson School of Pharmacy, Joanna Headley, Jefferson School of Pharmacy. Objectives: The study objectives were to identify student attitudes toward the use of technology to deliver content and the responsibility for peer-generated instruction. Method: Students worked in small groups to develop and asynchronously deliver new content as case-based presentations through the use of lecture capture software. The course coordinators ensured accuracy. Surveys administered at the beginning and end of the course gauged student attitudes toward technology and delivering and receiving peer-generated instruction. Item analysis was conducted on a cumulative assessment written by faculty to compare student performance on faculty- and peer-generated materials. Results: Twenty-two students completed the course in one semester (13 in the first-half and 9 in the second). The pre-course survey (n=22) reflected a positive attitude toward technology to facilitate learning (90% agreement), but indicated a lack of experience and confidence using technology to teach others (59% and 77%, respectively). Many students were also uncomfortable with being assessed on course content delivered by peers (72%). In contrast, the post-course survey found nearly all students (95%) were confident that they learned course content from their peers and every student was confident they were able to teach others using technology. Item analyses found no differences in student performance between faculty and student content. Overall student attitudes towards technology as an effective tool for synchronous and asynchronous instruction improved compared to baseline (95% versus 72%). Implications: Pharmacy student perceptions of technology as a teaching and learning tool may be improved with the asynchronous delivery of course content by students.

Student Evaluation of Online Pharmaceutical Compounding Videos. Robert P. Shrewsbury, University of North Carolina at Chapel Hill, Hanna Park. Objectives: The objective was to describe pharmacy students’ views of the effectiveness of the expansion of the compounding laboratory website at the UNC Eshelman School of Pharmacy. Originally, there were 43 videos available; in 2011, an additional 45 videos were added. Concurrently, all of the interactive questions were updated to fully integrate with the expanded video library. Method: PY1, 2, and 3 pharmacy students were surveyed about the expanded video library regarding accessibility, functionality, and usefulness, and how using the library impacted their learning of pharmaceutical compounding. Surveys from 391 students were analyzed by descriptive statistics. Mean and SDs were calculated for the rating scale questions; independent t-tests and Wilcoxon nonparametric tests were used to find differences between classes and campuses. Results: Videos were utilized by 386/391 students to prepare for their laboratory sessions, and 8.9/10 judged the videos as useful. Fifty-six percent spent an average of 1 – 2 hours per week using the videos to prepare for their laboratory session; 34% used the videos 30 minutes or less. The videos were rated as 8.5/10 for ease of accessibility, 7.4/10 for comprehensiveness, but the required course textbook was rated as more comprehensive (8.6/10) than the videos. There were no differences between the main and two satellite campuses. Implications: There is no standardized compounding curriculum in U.S. Schools of Pharmacy (AJPE 76(7):2012). These results suggest that the pharmlabs.unc.edu website could be an accessible, functional, and useful resource for the development of a standardized compounding curriculum.

Student Experiential Learning and Practice-based Cognitive Decline and Depression Screening in Ambulatory Seniors. Joseph A. Woelfel, University of the Pacific. Objectives: Active learning program objectives were to educate students in: performing cognitive decline-depression screening, identifying individuals at risk for cognitive decline-depression, and interventional considerations for at-risk seniors. Method: Student pharmacists enrolled in a required

(16%). The ISTJ (introvert, sensing, thinking, judging) personality type was the most common personality type reported for all survey respondents (17%). ISTJ was also the most common personality type reported among community (25%) and clinical (20%) pharmacists. Pharmacist administrators were most commonly ENFJ (introvert, intuitive, feeling, judging). Hospital pharmacists were most commonly ENTJ (extravert, intuitive, thinking, judging) (22%). Within each personality domain, the sample size was inadequate to identify a significant association between personality type and job satisfaction using regression analysis. However, over 80% of pharmacist respondents indicated having job satisfaction, regardless of pharmacy practice area or personality type. All respondents with the perceiver personality type reported job satisfaction. Implications: Although these findings should be validated in other sample populations, improving understanding of pharmacist personality types in various practice settings could provide insight into pharmacy career path planning, particularly for student exposure purposes.

Statewide Impact of an Online-based Pharmacy Informatics Curriculum. Timothy Cutler, University of California, San Francisco, Amanda Fangado, Xerox, Sokkim Lim, University of California, San Francisco, Bret Brodowy, University of California, San Francisco, Marco Gonzales, Edith Mirzadian, University of Southern California, Joseph A. Woelfel, University of the Pacific, Emmanuelle Schwartzman, Western University of Health Sciences, Junhua Yu, Touro University California, Ana Hincapie, California Northstate University, Joycelyn A. Yamzon, Loma Linda University, Susan McGuiness, University of California, San Diego, Elisa Ashton, University of California, San Francisco. Objectives: To evaluate pharmacy students’ attitudes toward, knowledge of, and confidence in achieving competencies in pharmacy informatics after exposure to online modules covering a wide range of topics relevant to health informatics. Method: The Accreditation Council for Pharmacy Education (ACPE) standards require pharmacy student curriculum include competencies in informatics. Recognizing the difficulty of integrating new material into an already packed curriculum, a California school of pharmacy created the Partners in E curriculum, which includes 12 distinct, online modules meeting ACPE requirements. The seven additional California schools of pharmacy adopted the curriculum, either using the modules to develop new standalone electives, or integrating them into existing, required courses and rotations. Across all schools, pre-/post-surveys were administered to (1) determine students’ prior exposure to pharmacy informatics (2) assess students’ knowledge of and attitudes toward pharmacy informatics and health information technology (HIT); and (3) evaluate participants’ confidence in achieving competencies in informatics. Results: A total of 948 California pharmacy students of all levels (P1 through P4) were trained using the Partners in E curriculum. Of these, 911 students completed the pre-/post-course evaluation surveys. Only 8% of students reported receiving any prior pharmacy informatics instruction through their pharmacy school coursework. After exposure to Partners in E, students showed a statistically significant increase in knowledge, attitudes, and confidence in achieving competencies in pharmacy informatics. Implications: As either a standalone elective or integrated within existing pharmacy curriculum, the Partners in E online modules can improve knowledge, attitudes, and confidence regarding competencies in pharmacy informatics for all levels of pharmacy students.
Introductory Pharmacy Practice Experience geriatrics course were trained to administer memory screening services (MSS) using the Mini-Cog tool and depression screening using Geriatric Depression Screen-15 (GDS-15). Student teams then screened facility-selected long term care residents for memory decline-depression at University-affiliated long term care facilities as part of their active learning coursework. The students were precepted by University faculty and facility staff. In the fall of 2013, the student pharmacists conducted outreach events targeting seniors in Northern/Central California. Under a University-approved IRB, demographic data, MSS and GDS-15 scores were recorded using a standardized questionnaire. Results: Seventy-seven seniors were screened for depression, 21% had GDS-15 scores of 5–10, suggestive of depression, 4% had scores of 11–15, indicative of depression. Seventy-nine percent of the depressed group had never been diagnosed and were not receiving antidepressant therapy. Eighty-three seniors were screened for cognitive decline. Of these, 12% had MSS scores associated with cognitive decline. Eighty percent of these seniors were not receiving therapy. Those identified with possible depression or cognitive decline were counseled by students under faculty supervision using approved written scripts. With the patient’s approval, prescriber communication was initiated and family members were called for those with GDS-15 scores of 14–15.

Implications: Through didactic education, active learning, and practice, student pharmacists can play an important role in identification of those at risk for depression-cognitive decline.

Student Perception of Evidence Based Medicine (EBM) Skills and Relevance to PharmD Curriculum and Career. Shannon L. Reidt, University of Minnesota, Amy L. Pittenger, University of Minnesota, Maureen Smith, University of Minnesota. Objectives: To develop a series of authentic, curriculum-integrated opportunities for students to practice evidence based medicine (EBM) resulting in student competency development and increased confidence in skill and perceived relevance to their curriculum and future practice Method: Pharmacy students participated in five two hour EBM workshops as part of their Foundation of Social Administrative Pharmacy (FSAPh) Course that focused on asking clinical questions, acquiring evidence, appraising evidence and applying it to patient care. Three weeks after the Workshops, students participated in three 90 minute practice laboratory sessions reinforcing Workshop content. Self-assessments were administered to students prior to the Workshop series, immediately after the workshop series, and after the series of laboratory sessions. Self-assessments evaluated students’ confidence in EBM skills and perceived relevance of skills to the curriculum and their future practice. Students were also required to pass an EBM competency at the end of the FSAPh course. Results: One hundred and five students completed all self-assessments. Prior to the Workshops, 53% of students felt confident in ability evaluate the validity of clinical evidence. After Workshops, 65% felt confident; after laboratory sessions 76% felt confident. Prior to the Workshops, 98% of students agreed that EBM was relevant to curriculum and to their future practice. This remained consistent across all assessments. Average score on the EBM competency exam was 82%. Implications: Contextualized application opportunities resulted in authentic practice experiences that increased learner confidence in EBM skills.

Student Performance in a Pharmacotherapy Oncology Module before and after Flipping the Classroom. John Bossaer, East Tennessee State University, Peter Panus, East Tennessee State University. Objectives: To determine if a flipped classroom improved student end of module exam performance in a pharmacotherapy oncology module. Method: Third year pharmacy students in the Class of 2013 experienced the Pharmacotherapy Oncology Module (15 contact hours) as traditional lectures with optional case studies as supplemental homework (ungraded). The Class of 2014 experienced the same module content with a flipped classroom approach. The middle 10 contact hours were flipped as follows: 10 Vodcasts (8 hours total time) and 6 hours of in-class case studies in place of optional case studies. Students were instructed to watch Vodcasts before in-class case studies, but were not held accountable (i.e. quizzed) for pre-class preparation. The exam questions were identical in both cohorts. Performance on exam questions covered with the flipped approach was compared between the two cohorts using ANCOVA with prior academic performance variables (GPA) as covariates. Results: The students experiencing the flipped classroom approach performed poorer on exam questions covering flipped topics than the cohort that received traditional lecture with optional case studies with previous GPA used as a covariate (p < 0.05). Implications: A flipped classroom approach to incorporate active learning does not necessarily improve student performance. Limitations of this flipped classroom experiment include long vodcasts (30 to 50 minutes) and lack of student accountability for watching vodcasts. Further research is needed to determine optimal classroom flipping techniques that result in improved student performance.

Student Preference for Traditional vs. Non-Traditional Presentation Modalities. Ashton E. Beggs, Belmont University, Alisa Spinelli, Belmont University. Objectives: To assess pharmacy student preferences and perceptions between traditional presentation modalities (PowerPoint®, printed posters) and non-traditional web-based presentation applications (Prezi®, Glogster®) in two pharmacy elective courses. Method: Thirty-four P2 or P3 pharmacy students were enrolled in either the Ambulatory Care Pharmacy or the Introduction to Medical Gerontology and Geriatrics elective. Course instructors implemented student use of two web-based presentation applications for group presentations in each course. In both electives, groups consisted of 3 or 4 students. Additionally, instructors utilized these non-traditional web-based presentation applications to present course material. A pre- and post-survey were administered focusing on student perceptions and preferences between traditional presentation modalities and non-traditional web-based presentation applications. Results: Thirty-three students completed the pre- and post-survey. Post-survey results demonstrated the majority of students preferred to both present and learn utilizing PowerPoint® as opposed to Prezi®. Additionally, a majority of students preferred presenting via a printed poster, but preferred learning from a Glogster® presentation. Implications: The use of progressive technology to enhance student learning is an important consideration when developing course curriculum. As demonstrated by the survey findings, students more frequently preferred more traditional presentation formats. Course instructors will continue to assess the most beneficial use of these non-traditional web-based presentation applications in elective courses.

Student Perceptions of and Performance in a Blended Foundational Drug Information Course. Peter J. Hughes, Samford University, Michael G. Kendrach, Samford University, Bruce A. Waldrop, Samford University, Jongwa Chang, Samford University. Objectives: Assess and trend student opinions of online educational components utilized in a redesigned 5-week (1 semester credit hour) foundational drug information course. Comparison of student performance on the final examination, overall course grade and changes in standardized unversity course evaluations between 2012 and 2013 were secondary objectives. Method: This course used narrated video instruction (Camtasia and Articulate Storyline) to replace traditional
face-to-face lectures coupled with use of a face-to-face weekly laboratory session. This project consisted of pre- and post-exposure surveys to allow for paired analysis of six opinion-based survey items using a 5-point Likert scale. Secondary objectives were compared between the 2013 and 2012 entering classes by use of paired t-tests. This research was IRB approved. 

**Results:** Only matched pairs were analyzed for this project (n=65 of 127 enrolled students; 51.2%). Changes between mean pre- and post-survey results indicated a decline in student favorability for traditional lecture styles (difference=-0.49 points; P<0.0001) and importance of face-to-face interaction with instructors outside class (difference=-0.46 points; P=0.0002) while demonstrating increased favorability for use of online video demonstrations as an acceptable substitute for in-person demonstration of skills (difference=0.34 points; P=0.02) and overall preference of online learning compared to traditional modalities (difference=0.44 points; P=0.0008). Standardized course evaluations completed by students did not differ between 2012 and 2013, while mean final exam scores significantly increased from 84.86% to 89.99% (P=0.0003), but not mean course grades (94.03% and 93.62%, respectively; P=0.36).

**Implications:** Blended course design is an effective pedagogical technique for foundational skills-based courses for Pharm.D. students.

**Student Pharmacist Perceptions of a Computerized Integrated Examination.** Sharon K. McDonough, The University of Tennessee, Stephanie J. Phelps, The University of Tennessee, Shannon W. Finks, The University of Tennessee, Robert B. Parker, The University of Tennessee, Elizabeth L. Alford, The University of Tennessee. 

**Objectives:** Integrated examinations (IEs) collate questions from required courses into a single examination given every 2 weeks. We aimed to assess first year students’ (P1) perceptions, attitudes, and behaviors after recently implementing this new testing method. 

**Method:** P1 students completed a survey assessing demographics, IE perceptions, and study habits before and after the first didactic semester. 

**Results:** Surveys were completed by 149 students (92% response). Pre-survey major concerns were the volume of material (49%), limited number of questions per course (14%), time allotted for examination (13%), and inability to write on the IEs (13%). No significant changes were noted in students’ concerns about the volume of material in the post-survey. Students’ concerns about the limited number of questions per course significantly increased to 28% in the post-survey (p=0.005). Concerns about time allotted (3%, p=0.001) and inability to write on the IEs (3%, p=0.001) were significantly lower in the post-survey. In the pre-survey, 34% of students anticipated they would prioritize study (spend more time studying for a particular course), 29% anticipated cramming (studying 1-2 days before), and 26% anticipated studying some each day. In the post-survey, students were less likely to cram (11%, p<0.001) but more likely to prioritize study (60%, p=0.001), especially for courses with more contact hours. 

**Implications:** Assessment methods can drive studying behavior, as shown by the way students adapted their study habits to the IE. Understanding student study habits and perceptions of IEs will help faculty improve these innovative exams in the future.

**Student Pharmacists’ and Recent Graduates’ Perception of and Interest in Independent Pharmacy Ownership.** Ashley M. Sweaney, The Ohio State University, Kristin A. Casper, The Ohio State University. 

**Objectives:** To assess student pharmacists’ and recent graduates’ interest in independent community pharmacy ownership; compare perceptions of pharmacy ownership among students and recent graduates; and explore personality traits within individuals interested in pharmacy ownership. 

**Method:** A cross-sectional, online survey was administered to student pharmacists currently licensed as interns and pharmacists licensed by examination from January 2010 to October 2012 within the state of Ohio. 

**Results:** 355 surveys were completed during the study period, with 200 (56.3%) completed by student pharmacists. Student pharmacists were significantly more interested in pharmacy ownership (p<0.001) and had significantly higher self-reported likelihood of ownership (p=0.03) compared to recent graduates. The majority of respondents had been exposed to pharmacy ownership within a course, student organization, or experiential rotation, but felt they needed more training in financial, legal, and regulatory issues. Nine percent of all respondents reported never being exposed to pharmacy ownership. Those with entrepreneurial tendencies were significantly more interested in ownership (p=0.016).

**Implications:** Many student pharmacists and new graduates are interested in pharmacy ownership, but feel unprepared to take on the basic financial, legal, and regulatory tasks involved. Resources need to be expanded for those interested in this career path. The 2013 CAPE Educational Outcomes calling for training within the PharmD curriculum to develop managerial and entrepreneurial skills may give impetus for further incorporation of this skill development.

**Student-Delivered Supplemental Instruction in a Therapeutics Course.** Amy M. Franks, University of Arkansas for Medical Sciences.

**Objectives:** To describe an innovative approach to supporting student learning in a therapeutics course. 

**Method:** A 2 credit hour special problems elective in teaching was offered to P3 students during 3 consecutive spring semesters. Enrolled students team-taught a 1-hour weekly supplemental instruction session in a Therapeutics course. 

**Results:** Three P3 students enrolled in the elective each semester and used techniques such as quizzing and gaming to reinforce course content. A mean of 32 P2 students (range 22-41) completed the survey each semester. The majority (85%) attended the sessions voluntarily. Nearly all (95%) reported benefit of sessions being led by upperclassmen rather than faculty. A majority (71%) reported that sessions improved exam performance. 

**Implications:** Students reported benefit from attending upperclassmen-delivered supplemental instruction sessions. This approach may support student learning in both under- and upperclassmen participating in the experience.

**Student-Demonstrated Knowledge Organization Structures for a Comprehensive Pharmacology and Therapeutics Exam.** Leah Sabato, The Ohio State University, Maria C. Pruchnicki, The Ohio State University. 

**Objectives:** Knowledge organization is a key factor for deep understanding of pharmacotherapy topics. This study characterized examples of student organizational strategies for a comprehensive cardiovascular exam. 

**Method:** Students completing an integrated module in their first disease-based therapeutics course were permitted to create an exam aid of one double-sided sheet including content of their choice without specific prompting. After the exam, a retrospective review of these aids was conducted focusing on type/origin, grouping,
and nature/amount of content. Characteristics including font size, color-coding, and white-space were also described. Results: Of 111 included exam aids, 77% were organized by disease state and 73% utilized all/most of available page space. Font size <12 predominated. Color-coding (55%) and/or boxes (35%) were used to delineate topics. Seventy-six percent included figures or tables; of those, 81% were either direct copies of instructor materials or with minor modification. Only 14% of exam aids contained novel charts or figures originally created. Implications: Organizational strategies used by students did not appear to represent deep understanding of pharmacotherapy content, as few aids incorporated novel charts or summaries of material indicating integration of information across topics or multiple lectures. However, examples of those strategies had been provided by instructors. Pharmacotherapy topics were described in isolation, often clearly delineated by boxes and/or color-coding. Investigators conclude that students were able to reproduce information provided to them within topics (both in content and style), but not integrate it across topics. Direct instruction and/or practice in knowledge organization networks may be of future benefit.

**Students’ Perspectives on a Mathlete Competition for Vancomycin and Aminoglycoside Pharmacokinetics in a Therapeutics Course**. Sarah Kim, Patrick Chan, *Western University of Health Sciences*. Objectives: Vancomycin and aminoglycosides are drugs requiring frequent pharmacokinetic (PK) calculations. The primary objectives of the study were to 1) implement the Mathlete Competition into an infectious disease course, 2) assess and characterize students’ perspective of the activity, and 3) assess students’ opinions on implementing the activity for drugs with a PK focus in other courses.

Method: Students (121 from the Class of 2015), split into 16 teams, participated in the competition. One student representing each team was sequestered into a room to solve a PK problem. Points were awarded based on speed and accuracy. Students who answered incorrectly were allowed to confer with their teams, but were penalized points. Each round required a different student from each team to compete. Students completed a voluntary 25-question (Likert Scale) survey post-competition. Results: A majority (97/116; 83.6%) of the students responded to the survey. Students strongly agreed or agreed that the competition was fun (87.6%), competitive (91.8%), and emphasized teamwork (87.6%). While 55.7% strongly agreed or agreed that the competition enhanced their learning, 73.2% expressed reinforcement of concepts. For the future, students strongly agreed or agreed that the activity should continue (80.4%) and at least one additional competition be implemented (77.2%) in the PK course. Implications: The Mathlete Competition is a novel method of enhancing and reinforcing student learning in a first-year PK course. While enriching student education, the activity fosters teamwork amongst future healthcare professionals. With an overwhelming majority of students expressing a desire for at least one additional competition, the Mathlete Competition is a beneficial activity in this first-year PK course.

**Students’ Preference for Delivery Style in a Large Team-based Learning Course**. Lana Dvorkin-Camiel, MCPHS University - Boston, Susan Jacobson, MCPPS University - Boston, Stefanie C. Nigro, MCPHS University - Boston, Amee Mistry, MCPHS University - Boston, Kathy Zaiken, MCPHS University - Boston, Catherine Taglieri, MCPHS University - Boston, Dhiren K. Patel, MCPHS University - Boston, David Schnee, MCPHS University - Boston, R. Rebecca Cirris, MCPHS University - Boston, Jennifer Goldman-Levine, MCPHS University - Boston. Objectives: To evaluate impact of students’ preference for delivery style on elements of team-based learning in a large required course. Method: PY3 students were enrolled in Over-the-Counter Drugs/Self-Care course offered in a flipped team-based learning format. At the end, students were anonymously surveyed about preference for teaching style and impact of preparation and in-class activities. Results: A survey was completed by 286 students. Students expressed content delivery preferences as follows: traditional (T) - 19%, flipped team-based (F) - 30%, combination of both (C) - 48%, no preference (N) - 3%. Within the delivery preferences students strongly agreed/agreed home preparation helped to: increase in-class participation (T38%, F79%, C71%, N50%), became interested in coursework (T21%, F83%, C59%, N38%), focus on important material (T38%, F86%, C68%, N63%), increase team collaboration (T38%, F88%, C78%, N75%), and enhance assessment performance (T43%, F84%, C71%, N50%). Students strongly agreed/agreed in-class activities solidified content understanding (T36%, F85%, C74%, N63%), stimulated interest (T28%, F78%, C60%, N50%), improved content application (T41%, F93%, C77%, N50%), enhanced communication (T62%, F81%, C79%, N75%), and enhanced assessment performance (T21%, F85%, C59%, N38%). Implications: Flipped team-based learning classroom format was positively received by a majority of PY3 students who identified flipped or combination of traditional and flipped as their preferred delivery style. A minority of students with preference for traditional teaching style appeared not to enjoy the flipped team-based learning format to the same extent. These findings will assist in redesigning the course to appeal to more learning/teaching styles.

**Students’ Self-reported Performance and Perceived Benefits/challenges of a Large Flipped Over-the-Counter/Self-care Course**. Lana Dvorkin-Camiel, MCPPS University - Boston, David Schnee, MCPPS University - Boston, Joseph DeMasi, MCPPS University - Boston, Amee Mistry, MCPPS University - Boston, Kathy Zaiken, MCPPS University - Boston, Catherine Taglieri, MCPPS University - Boston, Dhiren K. Patel, MCPPS University - Boston, Stefanie C. Nigro,
Successful Implementation of Three Standardized Certificate Programs into a Pharmacy Curriculum. Ashlee N. McMillan, West Virginia University, Mary K. Stamatakis, West Virginia University. Objectives: Determine the resources (faculty time and cost) associated with the implementation of three standardized certificate programs into the pharmacy curriculum. Method: Our school implemented the American Pharmacist Association (APhA) Diabetes and Immunization Certificate Programs in 2010 and the Medication Therapy Management (MTM) Certificate Program in 2013. All three of these programs were incorporated into existing courses in the third professional year of the curriculum. Two primary coordinators oversee each program, with 7 faculty teaching Diabetes, 7 teaching Immunization, and 9 teaching MTM. Faculty members were formally trained to teach in each program. The purpose of this project is to describe the implementation of these programs and determine resources required to provide the three programs annually. Results: The initial cost to train faculty to teach in all programs was $11,000. Annual per student cost for supplies and program materials is $95 for the MTM program, $106 for the diabetes program and $105 for the immunization program. Prior to initial implementation, 30 faculty hours were spent planning all programs. Annually, 6 faculty hours are spent conducting administrative activities for each program. Based on the way our school chose to implement the programs, total annual faculty hours spent teaching and assessing the skills components of the Diabetes, Immunization, and MTM programs was 60, 30, and 190, respectively. Implications: Incorporating high-quality standard certificate programs into an existing curriculum prepares students to provide diabetes care, immunizations, and MTM services; however, planning for faculty time and cost in advance is necessary for successful implementation.

Take Two: Screencasts to Improve Pharmaceutical Calculations (PC) Competency. Doreen Pon, Western University of Health Sciences, Eunice P. Chung, Western University of Health Sciences. Objectives: PC is taught in the first year and reinforced with reviews and PC exams (PCEs) 3 times over the second-third years. In the second year (P2), students attend a PC review and are given 40 practice PC questions (PPCQs), followed by a 20-question PCE. Historically, 15-20% of students do not pass PCEs. Screencast (digital recording of computer screen output with audio voice-over) solutions to PPCQs were created to help improve students’ PC skills. The objective of this study was to evaluate usage and perception of screencasts and impact on PCE results. Method: In 2013, screencasts were made accessible to P2 students via an internet-based classroom management system (Blackboard®). Hours spent viewing screencasts were tracked through Blackboard®. An Institutional Review Board-approved survey regarding use and perception of screencasts was administered to students at course completion. PCE scores and passing rates for P2 students in 2013 were compared to those in 2012. Results: In 2013, 134 P2 students spent an average of 6.45 hours (median 5.56 hours, range 0-30.98 hours) viewing screencasts. 74.6% of students completed the survey. 81% stated they viewed screencasts. 90% agreed the screencasts were useful. 82% were likely to view additional screencasts. Median PCE scores (95%, 90%, Mann-Whitney p=0.52) and failure rates (18.7%, 18.1%, Fisher’s exact p=1.0) were not different for 2013 and 2012. Implications: Although the majority of students found screencasts helpful, screencasts did not impact PCE scores and passing rates for the first in a series of PCEs. Further study is needed to determine the impact on future PCEs.

Teaching Communication and Teamwork through Interprofessional, Small Group, Case-based Curriculum. Thea Moore, University of South Florida, Rebecca Edgeworth, University of South Florida, Dawn DM Schocken, University of South Florida - Morsani College of Medicine, Frazier Stevenson, University of South Florida. Objectives: To teach and practice patient-centered communication and teamwork in an interprofessional, small group setting. Method: An interprofessional faculty team (consisting of nursing, pharmacy, physical therapy and medicine) designed a two-part educational module focusing on communication and teamwork. Student teams interact with a standardized patient in a small group setting. Teams were comprised of 8-9 students, including varied mixes of nursing, physical therapy, medical, and pharmacy students, with 2 faculty members. Teams meet twice during the academic year. The first patient encounter involved a woman recently discharged from the hospital to a skilled nursing facility (SNF) following a stroke. Each team devised and proposed a plan of care to the standardized patient (SP). The exercise included both team based planning and direct communication to the SP, along with reflection on the opportunities and challenges of the exercise. The second patient encounter utilized the same patient presenting for follow up, after returning home from the SNF. Students were part of a home health care or accountable care organization team that again was charged to interview the patient and develop a care plan. Results: The IPE activity has been successfully completed during two consecutive academic years. Students reported a high degree of satisfaction with the IPE educational activity, rating their group performance good or very good. Implications: Effective interprofessional teamwork has been shown to enhance patient care and improve health outcomes. Implementing IPE modules focusing on effective communication and teamwork will better prepare students to work in an increasingly multidisciplinary, collaborative healthcare system.

Teaching Pharmacy Students to Better Understand and Communicate with Spanish Speakers. Michael W. Neville, The University of Georgia, Gabriela Del Villar, The University of Georgia, Jennifer M. Robinson, The University of Georgia. Objectives: The purpose of this...
research was to assess a variety of teaching modalities focused on Spanish language to affect the attitude, self-perceived skill, and competency of 1st year doctor of pharmacy students. **Method:** First year doctor of pharmacy students at the University of Georgia (n = 145) were invited to participate in this IRB-approved study. The primary outcome was assessed through the use of online self-assessment questionnaires and by verbal/oral listening skill and on-line assessments. The self-assessment questionnaire was administered two weeks prior (pre-intervention) to the Spanish skill lab (intervention) and at the conclusion (post-intervention). Eight questions assessed self-perceived skill (SFS) using Spanish phrases, 6 assessed attitudes about Hispanic patients, and 2 evaluated learning methods. Laboratory exercises used video podcasts and translation cards, total physical response (TPR) stations that tested knowledge through simulation, and pharmacist-patient role-play interactions. Spanish Ph.D. candidates completed the end-of-semester verbal assessment. Pre- and post-intervention self-assessment questionnaires were matched for comparison. Frequency and Likert-scale responses were evaluated using Chi-square and Wilcoxon Signed Ranks analyses, respectively. **Results:** One hundred thirty-five (93%) completed the pre-intervention questionnaire. Matched data were available for 105/145 (73%). Significant (p < 0.05) changes were observed in 8/8 (100%), 3/6 (50%) and 2/2 (100%) of SFS, attitude and learning methods questions. The average end-of-semester live competency and on-line assessment scores were 96% (range 13-100%) and 86% (range 50-100%), respectively. **Implications:** Hands-on teaching and learning methods can improve the confidence and ability of pharmacy students to understand and communicate with Spanish speakers.

**Team-based Learning in a Mental Health Elective: Student Perspectives and Impact on Future Practice.** Amber Risselman, Sullivan University. **Objectives:** Pharmacists are typically not as comfortable counseling and monitoring patients with mental health disorders compared to patients with other disease states due to stigma and perceived communication difficulties. This study has two objectives: 1) evaluate pharmacy student perspectives over time on team-based learning (TBL) during a mental health elective and 2) evaluate pharmacy student attitudes over time about interacting with and counseling patients with mental health disorders. **Method:** Data was obtained using a pre, mid-point and post survey administered to students enrolled in a mental health elective course that utilized TBL at a college of pharmacy. The target population is pharmacy students taking the mental health elective; 22 students were enrolled in the course. The surveys were collected anonymously, and Microsoft Excel® was utilized for data analysis. **Results:** Significantly more students agreed or strongly agreed that their teams worked well together and that their teams helped improve their course grades on the post survey (p < 0.05). In addition, significantly more students agreed or strongly agreed that they are confident in their ability to perform on advanced practice experiences in a psychiatric setting on the post survey (p < 0.05). **Implications:** It is difficult to prepare students for interacting with mentally ill patients in typical classroom settings. Based on this small study, students found TBL beneficial to their education and this course increased their confidence regarding future psychiatric learning experiences. Results from this study may be used at other institutions to foster the initiation of team-based learning.

**The Amazing Disease State Management Race: Impact on Student Knowledge and Confidence.** Sarah L. Taylor, Jeanne E. Frenzel, North Dakota State University. **Objectives:** To assess knowledge/confidence gained in cardiology, infectious disease, and diabetes disease state management in 65, third year professional pharmacy students, using an interactive “Amazing Race” activity. In lieu of traditional lecturing, students simulated a pharmacist’s role, applying critical thinking and clinical knowledge, while competitively evaluating patient cases. **Method:** Using pre- and post-assessments, knowledge gained was evaluated using multiple choice questions and analyzed using absolute-relative percentage of knowledge gained per, and amongst, disease states. Confidence was assessed using a 4-point Likert scale (4 being “very confident”) and analyzed by summing and averaging absolute:relative confidence gained per, and amongst, disease states, in addition to “overall” confidence. **Results:** An absolute gain in knowledge of 37.7% in cardiology, 20% in infectious disease, and 72.3% in diabetes disease state management was identified. Relatively, 34.6% more knowledge was gained in diabetes versus cardiology, 52.3% in diabetes versus infectious disease, and 17.7% in cardiology versus infectious disease. An absolute gain in confidence of 12.4% in cardiology, 9.2% in infectious disease, and 24.6% in diabetes disease state management was observed. Relatively, 12.2% more confidence was gained in diabetes versus cardiology, 15.4% in diabetes versus infectious disease, and 3.2% in cardiology versus infectious disease. A 53.1% gain in “overall” confidence with disease state management was identified. **Implications:** This activity resulted in clinically meaningful gains in knowledge/confidence with diabetes disease state management, followed by cardiology and infectious disease, respectively. This translates to students being more prepared to manage patients with multiple, complex disease states in future practice experiences.

**The Development of a Skill-Based Course in Pharmacy Informatics.** Dana Manning, Wilkes University, Joseph Zarcone, Regional Hospital of Scranton, Adam Welch, Wilkes University. **Objectives:** To design and implement an elective course in pharmacy informatics. The aim of the course was to empower students to leverage technology to improve healthcare outcomes. **Method:** A two-credit elective course was offered to second and third year professional pharmacy students. The course outlined the history and development of informatics, the components and functions of medication management systems, the processes of medication ordering systems, and the evolving technologies impacting pharmacy. Students completed skill-based exercises on the storage of data, retrieval of data, generation of meaningful clinical reports, and management of networked information systems. Outcomes were assessed using a validated student response survey given during the final week of classes. Responses were collected on a five point Likert scale with 5 = strongly agree. **Results:** Eight students participated in the first offering of this elective and five students completed an evaluation. Students rated the overall quality of this course as high with a mean (standard deviation) response was 4.80 (0.40). Students agreed that technology was used effectively in the course, mean 4.80 (0.40). Forty percent of qualitative response comments regarded perceived importance of informatics and the potential for impact on healthcare outcomes. **Implications:** This elective course was successful in engaging students in the skills and technology central to pharmacy informatics. The course was high quality and utilized technology to improve the instruction of this important topic. This course maps to CAPE 2013 subdomain 2.2 (Medication Use Systems Management). Pharmacy informatics is a critical topic to include in the pharmacy curriculum, and skill-based instruction is effective.

**The Role of Online Learning in Pharmacy Education.** Leslie A. Hamilton, The University of Tennessee, Katie J. Suda, Department of Veterans Affairs, Center of Innovation for Complex Chronic Healthcare, R. Eric Heidel, University of Tennessee Medical Center, Sharon K. McDonough, The University of Tennessee, Andrea S. Franks, The University of Tennessee. **Objectives:** To assess knowledge, skills, and confidence in the use of technology to affect the attitude, self-perceived skill, and competency of 1st year doctor of pharmacy students. **Method:** A two-credit elective course was offered to second and third year professional pharmacy students at the University of Tennessee, Veterans Affairs, Center of Innovation for Complex Chronic Health Care. The course outlined the history and development of informatics, the components and functions of medication management systems, the processes of medication ordering systems, and the evolving technologies impacting pharmacy. Students completed skill-based exercises on the storage of data, retrieval of data, generation of meaningful clinical reports, and management of networked information systems. Outcomes were assessed using a validated student response survey given during the final week of classes. Responses were collected on a five point Likert scale with 5 = strongly agree. **Results:** Eight students participated in the first offering of this elective and five students completed an evaluation. Students rated the overall quality of this course as high with a mean (standard deviation) response was 4.80 (0.40). Students agreed that technology was used effectively in the course, mean 4.80 (0.40). Forty percent of qualitative response comments regarded perceived importance of informatics and the potential for impact on healthcare outcomes. **Implications:** This elective course was successful in engaging students in the skills and technology central to pharmacy informatics. The course was high quality and utilized technology to improve the instruction of this important topic. This course maps to CAPE 2013 subdomain 2.2 (Medication Use Systems Management). Pharmacy informatics is a critical topic to include in the pharmacy curriculum, and skill-based instruction is effective.
University of Tennessee. Objectives: Current student pharmacists often have significant exposure to online methods of learning in their pre-pharmacy educational experiences. With decreasing resources and faculty shortages in pharmacy education, online delivery of course content could be an efficient method to deliver pharmacy curricula while optimizing classroom time for active learning strategies. The purpose of this study was to assess student preferences associated with the utility of online learning methods such as online platforms, social media, and handheld devices. Method: An anonymous 36-question online survey was administered to third-year students enrolled in the Drug Information and Clinical Literature Evaluation course. Frequency statistics were used to describe student preferences. Results: A total of 160 students completed the survey, yielding a 92% response rate. Of these students, 61% preferred a blended course structure (with online and classroom components) throughout the curriculum, as compared to either individually. Approximately 74% of students find smart phones significantly or extremely valuable for their academic success. Almost 73% of students reported using their smart phones and 53% reported using their tablets “always” or “often” during the past year for academic activities; however, only 24% of students found paper textbooks significantly or extremely valuable for their academic success, less than 19% using them “always” or “often.” Implications: Pharmacy students prefer using some online learning methods to support their learning and academic success. When updating pharmacy curricula, schools of pharmacy should consider the inclusion of online learning methodologies.

The Use of Virtual Patients as a Platform for Hybrid Patient Assessment Lab. Sara A. Al-Dahir, Xavier University of Louisiana, Christopher J. Gillard, Xavier University of Louisiana, Kendrea A. Bryant, Xavier University of Louisiana. Objectives: The objective was to evaluate the feasibility of using virtual patients and on-line pre-lab assessments as a basis for developing a hybrid, on-line patient assessment lab in the second year of the pharmacy curriculum. Method: All students in the course (N=140 students) were assigned to branched-case learning using virtual cases after the in-lab instruction. The hybrid lab model was: a pre-lab assessment based upon pre-lab learning modules followed by an abbreviated in-lab session. Select labs (5 of 10) were assigned a post-lab virtual case. At the midterm and final, students completed OSCE based, practicum assessments. In addition, a 20-question opinion survey was used to assess student learning and collect feedback with regard to the exercise and virtual patient experience. Patient cases covered initial assessment through diagnosis. The test scores and opinion survey were analyzed using descriptive statistics, paired student t-test and ANOVA to determine the relationship between the learning method and test performance. Results: Student performed well (averages >90%) on all patient assessment practicums. There was a slight difference (94% vs 91%) in mean practical scores of assessments that were reinforced with an on-line case versus those that did not (p=0.035). The difference in standard deviations was large for those that did versus did not have on-line cases (4% vs 14%). Implications: Alternative teaching methods are common for didactic courses. This study explores the feasibility of using a mixed approach for laboratory-based courses. A mixed, hybrid online model may be an alternative to a standard patient-assessment lab in the pharmacy curriculum.

Time Spent at Work and Its Impact on the Academic Performance of Pharmacy Students. Rondall E. Allen, Xavier University of Louisiana, John Okogbaa, Xavier University of Louisiana, Daniel Sarpong, Xavier University of Louisiana. Objectives: The purpose of this study was to examine the impact of time spent at work on the academic performance of pharmacy students. Method: A 12-item survey instrument was administered to students at the end of the spring 2011 semester. Students provided demographic data, indicated their work setting if applicable and the number of hours worked per week during the fall 2010 and spring 2011 semester. The term grade point average at the end of each semester was the primary outcome. Descriptive statistics were used to describe the study sample. Stratified hierarchical linear regression models were obtained to assess the association between the number of hours worked and the GPA at the end of each semester, adjusting for potential covariates. Additionally, Analysis of Covariance (ANCOVA) was used to compare academic performance by type of work after accounting for hours of work and all the covariates. Results: The survey was completed by 384 (81%) of the students. There was an inverse trend in not being employed from the P1 to P3 year; the larger percentage of those employed worked (46.6%) at a chain store. For both fall and spring semesters, non-pharmacy related work was positively and significantly associated with GPA (Fall: β ± SE(β) = 0.295±0.118, p=0.0131; Spring: β ± SE(β) = 0.274±0.117, p=0.0202). However, work hours were negatively and significantly associated to GPA for the fall semester (β ± SE(β) = -0.011±0.005, p=0.0236). Implications: Hours worked and the type of work does have impact on academic performance of pharmacy students.

To Peer or Near-Peer? Examining Differences Between P1 vs. P2 Students as Teaching Assistants. Suzanne M. Galal, University of the Pacific, Thao Tran, University of the Pacific, Anita Wang, University of the Pacific, Christine Choi, University of the Pacific, John Mayberry, University of the Pacific. Objectives: Assess differences between the use of first-year (peer) versus second year (near-peer) students as teaching assistants (TA) in a first year skills-based laboratory course. Method: Practicum is a skills based laboratory assessing competence in the provision of various screening services (ex: blood pressure, blood glucose, cholesterol) and patient counseling modules. Students attend a 2 hour weekly laboratory working in groups of 5 and assigned a TA. TA’s consisted of both first and second year students who attended a one hour training session prior to class. TA’s review weekly material followed by a one-on-one assessment using a grading rubric. Qualitative feedback was given by TAs to students and recorded after the patient counseling sessions. Students completed a standardized quantitative TA evaluation at the end of each laboratory. Both qualitative and quantitative data was used in analysis. Results: Sixteen Peer (first year) and 33 Near-peer (second year) TAs were evaluated by 210 students for 7 weeks of teaching. There was no significant difference between peer and near-peer TAs in the quantitative measure and/or in terms of overall rankings (t_46=-1.41, p=0.16). Qualitative feedback from TAs to students was coded giving each response a 0 for poor quality and 1 for high quality. There was no significant difference in quality of feedback given by the two groups (t_46=0.59, p=0.56). Implications: There is no difference in the use of peer versus near-peer evaluation. Using peer evaluation over near peer evaluation can be useful due to scheduling and other resource conflicts.

Tracking Student Achievement of Course Learning Outcomes over Time. Richard O’Broota, St. John Fisher College. Objectives: This study is designed to document and evaluate in aggregate to what level students achieved the course learning outcomes in a Top 200 Course. Method: Computer based testing tracks the percentage of students who answer a test question correctly. When each test question is linked to a course learning outcome the percentage of students who attained some achievement of a learning outcome over time can be
tracked and evaluated. Learning outcomes for the course are as follows: classification, indication, adverse effects, brand-generic name, dose, dosage forms, mechanism of action, important drug interactions, and medical terminology.

**Results:** Student achievement of each of nine learning outcomes was tracked over three semesters, two semesters were the same group of students and the third semester was a different group. The data was graphed to identify trends. The lowest achievement of a learning outcome was 67% for identification of dosage forms and the highest achievement of a learning outcome was 99% for defining medical terminology.

**Implications:** Monitoring student achievement of learning outcomes in aggregate can help document and provide evidence of learning by students. The instructor could use this outcome data to help evaluate teaching strategies that improve student learning over time. From the student perspective the student can use their individualized data to focus their studies on their weakest learning outcomes.

**Two Year Assessment of the Accuracy of Resident Self-evaluation of Teaching in an Elective Course.** Melissa M. Chesson, *Mercer University*, Nicole L. Metzger, *Mercer University*, Kathryn M. Momary, *Mercer University*. **Objectives:** To analyze the association between residents’ self-assessment of their teaching in an elective course compared with students’ and course faculty’s perception of their teaching over a two year period.

**Method:** An elective course offered to pharmacy students was designed to provide didactic teaching opportunities for PGY1 pharmacy residents. Each resident selected a topic and submitted objectives, lesson plan, lecture content, active learning strategies, and quiz questions to course faculty who provided detailed feedback at each step. Residents completed two surveys using a 5-point Likert scale: a self-evaluation and an evaluation of their advanced preparation for the lecture. Residents’ self-evaluation scores were compared with faculty and students’ evaluations of their teaching utilizing descriptive statistics and Mann-Whitney tests.

**Results:** All residents (n=25) completed the surveys; 13 in year one and 12 in year two. Evaluations of teaching by residents and faculty had a median score of 4 (meets expectations). No difference was observed between the residents’ overall self-evaluation scores and faculty evaluations of resident teaching (p=0.173). Students scored residents higher than residents scored themselves (p<0.01) and higher than faculty scored residents (p<0.01). Overall, residents strongly agreed that advanced preparation was helpful, specifically generating objectives and a lesson plan. Residents also strongly agreed that faculty feedback was constructive.

**Implications:** During a two year period, residents accurately self-evaluated their teaching, which may be the result of detailed feedback provided by faculty during residents’ preparation for the course. Residents can be used to provide quality didactic instruction when faculty are involved in lecture development.

**Typology of Faith-Based Colleges and Schools of Pharmacy in the United States.** Jack Chen, *Loma Linda University*, Katelyn E. Horne. **Objectives:** To differentiate characteristics and intensity of religious identity integration within programmatic activities of faith-based colleges/schools of pharmacy (faith-CSOs) in the United States.

**Method:** The Accreditation Council for Pharmacy Education website identified all CSOs (any accreditation status) as of September 3, 2013. Faith-CSOs were defined by explicit articulation of religious identity in the CSP/university mission statement or other self-descriptive text. A fourfold typology (revised from Sider and Unruh 2013) determined religious identity integration based on: 1) explicit articulation of religious identity in mission statement or descriptive text, 2) religion course requirements, and 3) chapel/riturgy requirements. Typologies were faith-centered, faith-affiliated, faith-background, and secular.

From each CSP website, data were collected and ascertained independently by two investigators (September 3 to January 6, 2014) including CSP geography and presence of explicitly articulated religious identity and evidence of religious integration within programmatic activities (i.e., curriculum, chapel/riturgy requirements). Implicit (e.g., non-articulated religious/faith beliefs) elements were not captured. Data was analyzed on Microsoft Excel spreadsheet with descriptive statistics.

**Results:** In the U.S., 22 of 129 (22%) CSOs are faith-based. Among faith-CSOs, the majority are in the South (45%) followed by Midwest (24%), Northeast (21%), and West (10%). Religious identities are Protestant (59%), Roman Catholic (34%) and Jewish (7%). The typologies are faith-affiliated (48%), faith-centered (28%) and faith-background (24%). Additional data matrices and subgroup analyses will be presented.

**Implications:** The term “faith-based” is undifferentiated. A typology of faith-based CSOs can add clarity and precision to discourses in comparative research, funding/philanthropy, public/stakeholder relations, and recruitment.

**Use of Posters to Enhance the Accreditation Self-Study Process.** Jane R. Mort, *South Dakota State University*, Teresa M. Seefeldt, *South Dakota State University*. **Objectives:** Obtain input on and increase knowledge of the College’s self-study through a poster session.

**Method:** A one-hour electronic poster session was held following completion of the first draft of the College’s self-study. Poster topics were selected based on national issues, self-study concerns, and matters from the prior self-study. Six posters (Mission, Curriculum, Practice Experience, Faculty/Staff, Students, and Miscellaneous) contained information/data related to the specific topic. Participants (faculty, staff, stakeholders) completed a poster input card including information learned, suggestions, and guided questions and an evaluation form. Faculty reviewed three of six posters while stakeholders and staff reviewed all posters.

**Results:** Forty-one input cards were completed. 81.3% of participants completing evaluations felt the input cards allowed them to contribute their opinion on the self-study. Common input themes focused on active learning, experiential simulation, workload, and faculty stress. Insight was also obtained from guided questions regarding course load and progression. 71.0% of participants completing evaluations indicated the posters increased their knowledge of the College’s current self-study. The top five topics learned were the relationship between the mission, strategic plan, and assessment plans; Mission poster - 61.5% of participants; unique learning strategies within the curriculum (Curriculum poster - 43.5%); faculty stress survey results (Faculty poster - 40%); nature of interdepartmental project (Faculty poster - 36%); and students’ participation in committee/advocacy work (Student poster – 30.4%).

**Implications:** Posters served as an effective way to obtain input and increase knowledge of the College’s self-study. This information also guided subsequent information sharing by identifying concerns and confusion.

**Use of Virtual Patients to Promote Active, Patient-centered Learning in an Advanced Pharmacy Therapeutics Course.** Michael A. Smith, *University of the Sciences*, Rima A. Mohammad, *University of Michigan*, Neal J. Benedict, *University of Pittsburgh*. **Objectives:** To assess student learning and satisfaction of course objectives following the integration of virtual patient cases designed to promote active, patient-centered learning in a pharmacy practice. **Method:** To assess student learning and satisfaction of course objectives following the integration of virtual patient cases designed to promote active, patient-centered learning in a pharmacy practice. **Method:** vPSim (Decision Simulation LLC, Chadsford, PA), a dynamic virtual patient platform incorporating a branched-narrative decision making model, was used to create interactive patient cases to supplement lecture content in an advanced therapeutics practica. Student learning was assessed using pre- and post-simulation tests scaled using Bloom’s taxonomy. Student satisfaction was assessed using a post-course
survey that included five point-Likert and free response questions. **Results:** Pre- and post-simulation tests were used to assess student learning. The virtual patients significantly enhanced student learning for both higher and lower level test questions (p<0.00001 and 0.01, respectively). Students agreed or strongly agreed that the virtual patients were an effective way to learn (72%), were enjoyable (69%), more should be incorporated (59%), and were appropriate in content (80%). **Implications:** The use of virtual patients in an advanced therapeutics practica was an effective way to promote active, patient-centered learning; engage students in an interactive and dynamic educational technology; encourage teamwork; enhance higher level student learning; and improve student satisfaction.

**Use of a Flipped-classroom Design in Teaching a Specialty Pharmacy Elective.** Matthew Nelson, Roosevelt University, George E. MacKinnon, Roosevelt University. **Objectives:** The object of this study was to evaluate the effectiveness and satisfaction of teaching using a flipped-classroom design on student outcomes and satisfaction for an elective course focusing on specialty pharmacy. **Method:** Students were responsible for completing online modules from the National Association of Specialty Pharmacy (NASP) website with four therapeutic focuses: age-related macular degeneration, viral hepatitis, hemophilia, and pulmonary hypertension. Students instruction was augmented by submitting questions regarding the material to campus instructors via Blackboard Learn. After completion of each set of modules, students attended a recitation session where their questions were discussed and answered, and they completed practical case-based assignments. Students participated in a questionnaire that assessed the course content, structure, satisfaction, and effectiveness. **Results:** Of the forty-eight students that enrolled in the course, twenty-seven (56%) completed the survey. Twenty-two students (81.5%) found the on-line format of instruction an effective way to learn the material, and twenty students (74%) wanted to have more on-line courses offered in the doctor of pharmacy program. Across the four topics, 85% of students thought that the in-class activities helped them understand the course content, structure, satisfaction, and effectiveness. **Implications:** The use of a flipped-classroom to teach specialty pharmacy topics from an on-line externally supported resource appears to be an effective way to deliver material to pharmacy students.

**Use of an Objective Structured Clinical Examination to Evaluate Clinical and Communication Skills.** Elizabeth M. Urteaga, University of the Incarnate Word, Rebecca L. Attridge, University of the Incarnate Word, Amy P. Witte, University of the Incarnate Word. **Objectives:** We used an objective structured clinical examination (OSCE) to evaluate how effectively second-, third-, and fourth-year pharmacy students’ communicate and apply knowledge to simulations of commonly encountered patient scenarios. The progression of performance of second- to third-year and third- to fourth-year pharmacy students was evaluated. Students’ perceptions were collected to explore the strengths and weaknesses of the assessment. **Method:** Second-, third-, and fourth-year pharmacy students enrolled at the Feik School of Pharmacy completed an OSCE as part of their required courses in 2012 and 2013. The 2013 OSCE was followed by a short survey given to all students. Data were analyzed using the statistical program JMP 10.0®. Descriptive statistics were used to report student perceptions assessed through responses on a Likert scale. All other comparisons were considered statistically significant if the p-value was less than an a priori alpha level of 0.05. **Results:** In 2013, 274 pharmacy students completed the OSCE. The median communication and clinical scores out of a score of 100 ranged from 94.5-97.2 and 53.6-54.4, respectively. Progression data revealed an improvement in performance for both the second- to third-year pharmacy students (p<0.0001) and third- to fourth-year pharmacy students (p<0.0001). Two hundred and eighty-one students completed the anonymous survey. Over 97% agreed that the OSCE was a well-structured and practical experience; however, only 86% felt competent to provide the type of care seen in the OSCE. **Implications:** The results of this study demonstrate competence in communication skills and provide encouragement that clinical skills improve as the students’ progress through the curriculum.

**Utility of an Assessment Tool Based on the ASHP Clinical Skills Competition Assessment Model.** Evan Williams, Husson University. **Objectives:** To assess the utility of a 3-sectioned assessment tool based on the ASHP Clinical Skills Competition (CSC) model in an advanced case studies class for third year (P3) pharmacy students. **Method:** P3 students in a required case studies class created pharmaceutical care plans with a 3-sectioned worksheet based on the ASHP CSC assessment tool. Course objectives were matched to desired outcomes through the worksheet. The worksheet was used as the assessment tool for exams to determine achievement of course objectives. Course surveys were given at the end of the class to assess student perceptions. An additional survey was distributed to students 23 weeks into their advanced pharmacy practice rotations regarding the utility of the assessment tool in developing skills creating care plans. **Results:** Course outcomes and objectives were matched with the results gathered by the assessment tool and show achievement of the desired outcomes and objectives. Course survey results indicate 94% of respondents agree the assessment methods used was appropriate. Results from the second survey indicate greater than 80% of respondents agree the assessment tool was and effective, appropriate, and improved their ability to create care plans on clinical rotations. **Implications:** The assessment tool was positively perceived by students. The tool was effective for mapping course outcomes and objectives, and was able to demonstrate to the coordinator that the desired outcomes were being achieved. This assessment tool was a well-received approach for improvement of care plan development skills.

**Variations of Campus Assignment Policies at Colleges of Pharmacy with Distant Campuses.** Lindsey E. Dayer, Amy P. Witte, University of Arkansas for Medical Sciences, T. Scott Warmack, University of Arkansas for Medical Sciences, Schwanda K. Flowers, University of Arkansas for Medical Sciences. **Objectives:** Describe the methods of campus assignment policies (CAP) for colleges of pharmacy (COP) with distant campuses to determine alternative processes for campus reassignment. **Method:** Websites for cohort COP for benchmarking comparisons were analyzed (n=23). Those with distant campuses were identified (n=17) and their policies and procedures for campus assignment and reassignment were described. The various methods of CAP associated with these COP were evaluated and compared using descriptive statistics. **Results:** Website information regarding CAP for the 17 cohort schools was analyzed to compare processes. Only seven COP have a published policy for campus assignment available on their website. Of the 17 schools, approximately 41% move to the distant campus during their P3 year and 41% begin the P1 year at the distant campus. We were unable to document this information for three COP. Eleven schools allow students to select their preferred campus. Four of these allow selection during the interview process. Other timeframes for campus selection include selection upon admission to the program via supplemental or campus selection forms. Of the 17 schools, seven
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state on their website that students may request a campus switch based on student written requests, however only four schools have a formal campus reassignment committee; other methods of campus reassignment include the dean or associate dean having the final selection or assignment by the admissions committee. Implications: There are many variations in CAP across cohorts. Future directions include determining which process results in improved student satisfaction and fewer campus reassignment requests.

Web-based Electronic Health Record Program: Impact on Medicare Part D Annual Comprehensive Medication Review. Mok T. Chong, American University of Health Sciences. Objectives: Medicare Prescription Drug Plans consist of a required Medication Therapy Management (MTM) service for its eligible patients. This includes an annual comprehensive medication review and follow-up interventions as needed. The objective of this study was to evaluate the use and effect of a web-based Electronic Health Record (EHR) program used by the pharmacists to perform comprehensive annual medication review for the Medicare Part D Beneficiaries. Method: Eligible Medicare Part D Beneficiaries were identified and enrolled. A sophisticated Electronic Health Record Program which had the capability to extract and integrate clinical and administrative data from a variety of disparate sources was used. Thus, the pharmacists were able to assess the appropriate medication use by accessing to laboratory, pharmacy, diagnosis, procedure, and patient information. A post-review summary was provided to the medical provider which included a medication action plan. At the end of the three months, data were collected and assessed.

Results: Of the one hundred sixty three (163) Medicare Part D Beneficiaries, pharmacists’ interventions were recommended to thirty six percent (36%) of the participants. After three months, it showed that twenty five percent (25%) of the recommended interventions were acknowledged and implemented by the medical providers. The study revealed that the most common medical conditions required interventions among this patient population included central nervous system, cardiovascular disorders and endocrine disorders. Implications: The finding revealed that such web-based EHR system was a very useful and effective tool in assisting pharmacists to assess the appropriate use of medication in the elderly patients.

Writer’s Block: A Longitudinal Faculty Development Program. Amy M. Franks, University of Arkansas for Medical Sciences. Objectives: To describe an innovative approach to supporting faculty development in scholarly writing. Method: A “block” of 5 monthly 1.5-hour noon sessions were designed to provide a longitudinal structured scholarly writing development exercise. Faculty meeting the following criteria volunteered to participate: 1) embarking on first manuscript writing as primary author, 2) willingness to participate in all sessions, and 3) willingness to review and provide feedback on a peer’s manuscript draft. Sessions were focused on identifying the manuscript’s key discussion points, identifying the target journal, drafting an outline, developing the manuscript section by section, and providing peer review. Participants were asked to complete specific writing assignments following each session. Faculty provided feedback about the exercise’s value via anonymous survey. Results: Nine faculty members participated, and 8 completed the feedback survey. Six (75%) reported that the sessions helped them commence writing, while all faculty reported the sessions were helpful in making progress on their manuscript. The majority (88%) felt the exercise helped in navigating the writing process. The most frequently selected helpful aspects of the exercise were group feedback (100%), encouragement (100%), scheduling deadlines (88%), group accountability (88%), and advice (88%). All reported the group format was helpful, they would participate again, and they would recommend it to peers.

Implications: This longitudinal development exercise was valued by faculty participants. Faculty feedback suggests group accountability and supportive interactions are helpful in achieving scholarly writing goals. Implementation of similar programs may be beneficial to developing scholarly writing skills of junior faculty.

iCARE: Integrity, Compassion, Accountability, Respect, and Excellence. A Simulated Interprofessional (IP) Medical Rounds Experience. Erini S. Serag-Bolos, University of South Florida, Shyam Gelot, University of South Florida, Dawn DM Schocken, University of South Florida - Morsani College of Medicine, Vinita C. Kiluk, University of South Florida - Morsani College of Medicine, Laura Haubner, University of South Florida - Morsani College of Medicine. Objectives: The Accreditation Council for Pharmacy Education considers IP education and exposure to team practice as an integral component of pharmacy education. Interdisciplinary medical rounds are becoming the mainstay in several inpatient settings and this IP experience introduced teams of pharmacy and medical students to simulated medical rounds. Objectives include gaining a deeper understanding of each other’s roles, patient evaluation, developing a concise therapeutic plan, and incorporating values-based patient care. Method: A class of third year pharmacy (P3) and medical (M3) students were divided into thirty-two groups consisting of one P3 and two M3s. Groups were separated into three cohorts and rotated through three stations with standardized patients. The first station involved medical management of a patient with acute decompensated heart failure in the cardiac care unit. The second station consisted of a pain management case with a pseudoallergy. Lastly, the third station depicted medical management of a patient with a urinary tract infection and hand-offs using the SBAR format (Situation, Background, Assessment, Recommendations). Stations culminated in de-brief sessions with students and faculty. Results: Course evaluations revealed student benefit from the interprofessional encounter. Thirty-two P3s and fourteen M3s completed the post-activity survey, which consisted of fifteen questions using a 5-point Likert scale (1 = poor, 5 = excellent). Overall, P3s and M3s evaluated their team’s ability to make a group decision as 4.8 and 5, respectively. Implications: The IPE scenarios allowed for robust discussions between health students and instilled the values-based practice model. Future simulations will aim to include nursing and physical therapy students.

Theoretical Models:

ASSURE Model: Using a Campus Common Reading Through the “Spirit Catches You.” Martha H. Carle, University of Arkansas for Medical Sciences, Kendrea M. Jones, University of Arkansas for Medical Sciences, Sarah N. Ashby, University of Arkansas for Medical Sciences. Objectives: Using the ASSURE model to implement a common reading program to engage students in the study of professionalism, ethics, and health literacy by understanding the variations in human culture and perspectives in diverse groups. Method: The college instructional designer and course coordinators used a six step model (ASSURE) in designing the Common Read: Analyze: Pharmacy students in the P1-P3 years were required to read “The Spirit Catches You and You Fall Down” by Anne Fadiman. Course coordinators analyzed the content and chose 3 main themes. State Select Utilize: A pretest assessed book knowledge at the beginning of the semester. Lectures in corresponding courses (Career Orientation, Dispensing, Law and Ethics) along with discussions, case studies, and Team Based Learning (TBL) activities were delivered in early Fall. Require Evaluate: Students were required to attend the author’s
The TBLs were assessed using Readiness Assurance Tests (RATs). An evaluation of the activities was collected using qualitative reflections in e-folios. **Results:** The College had a total of 356 student participants. The students’ mean score on the knowledge (professionalism, ethics, and health literacy) pretest was 90.4. In the TBL sessions, mean scores were: 85.3 (IRAT) and 96.8 (GRAT). The evaluations identified data of reoccurring themes and positive effects. **Implications:** The activities provided an orientation based program for the P1’s and course based programs for the P2 and P3 years. Themes identified in the reflections resulted in a college curricular change. Through the ASSURE model, the goals/outcomes and Common Read provided meaningful learning experiences across the curriculum.

**Adjunct Pharmacy Practice Faculty Promotion: Current Practices and Future Models.** Matthew Pitlick, St. Louis College of Pharmacy, Antoine T. Jenkins, Chicago State University, Kim G. Adcock, The University of Mississippi, Edward F. Foote, Wilkes University, Scott D. Hanes, Rosalind Franklin University of Medicine and Science, Michelle L. Hilaire, University of Wyoming, Pamela L. Stamm, Auburn University, Courtney J. Jarvis, MCPHIS University – Worchester/Manchester, Jaclyn A. Kruse, Northeast Ohio Medical University, Meghan Jefferis, Roseman University of Health Sciences, Brian L. Erstad, The University of Arizona, Nicole M. Stack Lodise, Albany College of Pharmacy and Health Sciences, Michael W. Neville, The University of Georgia. **Objectives:** To summarize the use of current adjunct faculty promotion guidelines among pharmacy practice faculty and provide recommendations for guideline development. **Method:** Members of the 2012 – 2013 AACP faculty development committee searched college of pharmacy websites for available promotion guidelines. When none were available, members queried faculty members by telephone or email. Available standards were evaluated and compared by examining the following criteria practice, teaching, scholarship, service, recognition in the profession, time-in rank, documentation, and overall guidance. Consensus was reached regarding recommendations for promotion standards. **Results:** Of 129 ACPE accredited colleges of pharmacy, 48 had promotion documents posted online. Twelve of 48 (25%) institutions had specific guidance for adjunct faculty. Twenty-four colleges (50%) offered no specific guidance for adjunct faculty and 10 (21%) used non-tenure or tenure guidelines. Standards for promotion vary widely among colleges of pharmacy. The average time in rank is six years (range 1-12) before promotion. Regional/national recognition, board certification, and management or leadership experience were routinely required for promotion. Regional/national recognition, board certification, and management or leadership experience were routinely required for promotion of adjunct faculty. Standards for teaching included experiential rotations (minimum number of students per academic year) and didactic lectures (minimum number of hours). Standards for scholarship included publications and grant funding, but varied widely. Standards for service included levels of service to the institution and professional organizations, but also varied widely. **Implications:** Pharmacy practice departments routinely depend on adjunct faculty, but most have no specific guidelines for promotion for this group. Guidelines for promotion of adjuncts should be well aligned with their required responsibilities. Recommendations regarding specific criteria for promotion will be proposed.

**Design of a Value-Based School of Pharmacy Admissions Committee Rubric.** Beth M. DeJongh, Concordia University Wisconsin, Douglas J. Borys, Concordia University Wisconsin, Anne G. LaDisa, Concordia University Wisconsin, Sarah Ray, Concordia University Wisconsin, Peter Welch, Concordia University Wisconsin, Michael C. Brown, Concordia University Wisconsin. **Objectives:** The previous system Concordia University Wisconsin School of Pharmacy (CUW-SOP) Admissions Committee utilized to evaluate candidates was a numeric, non-rubric based system that did not overtly consider all the attributes the school values in its students. This quality improvement initiative sought to: 1) Build a consensus of what admission committee members value in prospective pharmacy students; 2) Design a rubric that facilitates evaluation of prospective students on these valued qualities. **Method:** The design of the rubric involved input from admission committee members, admissions staff, and local pharmacists. A literature review determined pre-admission variables associated with student success in pharmacy programs. Committee members reviewed these variables and independently submitted qualities they value in candidates. Submissions were grouped according to common qualities selected. Members discussed the qualities to determine which should be included and subsequently developed the admissions committee rubric. **Results:** Committee members submitted seventeen qualities. The majority of qualities could be grouped into seven categories: grade point average; Pharmacy College Admission Test; references; motivation for/understanding of pharmacy; pharmacy work/volunteer experience; service; and communication. The rubric was designed to evaluate these seven categories of qualities on a scale of excellent, good, marginal, and poor with descriptions of what constituted each rating. **Implications:** The current rubric system helps admission committee members evaluate candidates based on qualities associated with success in the literature and qualities the School values. The rubric facilitates evaluation of candidates in a holistic, consistent and focused manner. Future work will address the outcomes associated with implementation of the rubric.

**Design, Development, and Implementation of an Affordable Care Act Continuing Education Course.** Amanda M. Zessin, Cynthia N. Nguyen, University of the Incarnate Word, William D. Linn, University of the Incarnate Word. **Objectives:** The Affordable Care Act (ACA) is a complex piece of legislation that will have significant impact on the pharmacy profession. There is a dire need for continuing education in order for pharmacists to adapt to these new regulations. This project will develop such a module. **Method:** Student members of the Phi Lambda Sigma Pharmacy Leadership Society interviewed key stakeholders impacted by the ACA. These included retail and independent pharmacists, institutional pharmacists, health insurance providers, legislators, and physicians. Information gathered from these interviews was used to develop a questionnaire that assesses a pharmacist’s knowledge and understanding of the ACA specific to pharmacy practice. The questionnaire will be administered to pharmacists and pharmacy students using SurveyMonkey®. Data from the survey will be used to develop a continuing education program. **Results:** Discussions with key stakeholders identified four specific areas of concern: knowledge of the ACA, in-network contracting, reimbursement for services, and the profession’s development. Overall, the assessment of gaps in knowledge recognized via the questionnaire resulted in the development of a continuing education course for pharmacists. **Implications:** The questionnaire provided valuable information on the uncertainties behind the significance of the ACA on the pharmacy profession. Pharmacists must completely understand the intricacies of the ACA. Failure to do so could jeopardize the future of the profession. The questionnaire can be utilized nationwide to assess pharmacists’ ACA knowledge and will enhance their ability to make the best decisions/recommendations regarding the ACA.

**Development of a Pharmacotherapy Capstone Course to Further Develop Problem Solving and Clinical Reasoning Skills.** Rebecca L. Focken, North Dakota State University, Natasha Petry, North Dakota State University. **Objectives:** To describe the curricular design of
a third year pharmacy practice experience at North Dakota State University utilizing evidence based methods of problem solving and clinical reasoning skill development among students. **Method:** A review of the literature was completed to identify best practices in teaching problem based learning in both healthcare and non-healthcare disciplines. Best practices in teaching clinical reasoning within healthcare disciplines within the literature were also reviewed. **Results:** The findings of the literature review were used to guide the development of a three credit pharmacy practice course during the semester immediately preceding Advanced Pharmacy Practice Experiences (APPEs) at North Dakota State University. The application of evidence-based teaching methodologies including cooperative learning, problem based instruction, and discussion will be described along with how these methodologies were integrated into both the curricular design and selection of course assessment strategies. **Implications:** The development of an evidence-based capstone pharmacy course experience prior to advanced pharmacy practice experiences is a strategy that can be used by colleges of pharmacy to assist students in further developing problem solving and clinical reasoning skills following the completion of a pharmacy practice course as a bridge between pre-APPE and APPE curriculum requirements. The development of this course serves as an introduction for further research in the development of problem solving and clinical reasoning skills as an educational strategy in the education of students in healthcare disciplines.

**Enhancing Ambulatory Care APPEs by incorporating Patient Centered Medical Home Principals.** Nabilah Ahmed-Sarwar, St. John Fisher College, Angela K. Nagel, St. John Fisher College. **Objectives:** Incorporation of various clinical activities during ambulatory care APPEs to achieve exposure to the five patient centered medical home (PCMH) practice principals providing Pharm.D. Candidates with a strong foundation for future patient centered care practice. **Method:** The APPE is designed to engage students in activities involving the five principals of a PCMH practice. Students that are assigned to complete their Ambulatory Care APPE at one of two Level 3 National Committee for Quality Assurance (NCQA) certified PCMH Family Medicine Residency Training Practices are directly involved in engaging patients in decision making and management of chronic disease states, improve communication directly between patients and providers through the use of an electronic medical record, coordinate care with other health professionals through care transitions, and contribute to the transparency of comprehensive evidence based care of patients through patient education. **Results:** A total of 15 students have completed the redesigned APPE that emphasizes the role of a pharmacist in delivering care in a PCMH practice. Of the 15 students, 8 are seeking advanced training by pursuing post-graduate training in a variety of settings including ambulatory care, managed care, and community pharmacy. One of the students intends to pursue an additional certification to enhance their skills in delivering collaborative patient centered care.

**Establishing a Valid Patient-Centered Communication Evaluation Rubric Template for Use across the Curriculum.** Jennifer M. Trujillo, University of Colorado, Kari L. Franson, University of Colorado. **Objectives:** To develop a patient-centered communication evaluation rubric template with content, construct, and face validity for use throughout the curriculum during objective structured clinical examinations (OSCEs). **Method:** A faculty group involved in active-learning, practice-based courses underwent an extensive process to establish the template. The group traveled to Alverno to learn how to create a communication evaluation based on ability-based outcomes (Construct). Then they modified the items to represent communication skills specific to a pharmacist. The template was reviewed by course directors with input from experts including simulation center director, BCPS clinical pharmacists, and faculty members in ambulatory care or with Masters and PhD in Education. All group members provided feedback on content, organization, terminology, and clarity of the template (Content). Course directors across the curriculum use the template as the preferred method for evaluating patient-centered communication. Students use the template as a basis for communication during experiential activities throughout the curriculum (Face). **Results:** A template was developed through a rigorous process that established content, construct, and face validity. There are 7 criteria categories with multiple indicators in each. Criteria are evaluated using: 1) performed, performed incompletely or incorrectly, did not perform or 2) most of the time, some of the time, rarely, never. The template provides core communication criteria for multiple rubrics including medical history, medication history, self-care counseling, and prescription counseling. **Implications:** Our Doctor of Pharmacy program has successfully developed a valid rubric template that can be adapted for use across the curriculum to evaluate any patient interaction OSCE.

**Improving Health of At-risk Rural Patients: The Virginia Commonwealth University and Carilion Clinic Partnership.** Gary R. Matzke, Virginia Commonwealth University, William Lee, Carilion Clinic, David Harlow, Martin Health System, Leticia R. Moczyczenga, Virginia Commonwealth University, Michael J. Czar, Carilion Clinic. **Objectives:** Rural residents in southwest Virginia have a high risk of chronic disease and limited access to acute and chronic health care. Virginia Commonwealth University School of Pharmacy and Carilion Clinic, an ACO with 7 hospitals and 50 PCMHs (VCUCC) partnered to add the need for interprofessional care by creating a coordinated care model empowering hospital, primary care clinic, and community pharmacists with shared access to electronic health records to optimize patient health outcomes. **Method:** Weekly VCUCC leadership meetings facilitated the implementation and evaluation of the integrated education and patient care model. Educational programs to prepare pharmacists for patient centered care were created. The pharmacist documentation system to assess clinical, economic, and humanistic outcomes was integrated in the CC electronic health record. Chronic disease state management protocols to standardize and coordinate care at 60+ settings were implemented in 2013. A secure server for data was developed and analysis was led by VCU faculty. This partnership was funded in part by the CMS innovation center. **Results:** Monthly VCU visits to CC and weekly leadership conference calls were used to link the patient care, outcome improvement, and outcome evaluations. The VCU educational and evaluation expertise facilitated CC’s inclusion of pharmacists into 20+ clinics and the establishment of a network of 25 community pharmacies. These new CC practice settings expand VCU’s IPPE and APPE offerings. **Implications:** Partnerships such as this can be the driving force for care and educational models that expand pharmacists’ roles, improve patient outcomes, and increase student pharmacist access to advanced practice experiences.

**Improving collaboration among AACP members:** Recommendations from the Council of Faculties Consortia and Collaborations Taskforce. Margarita V. DiVall, Northeastern University, Jennifer Danielson, University of Washington, Christian B. Albano, Concordia University Wisconsin, Gina M. Baugh, West Virginia University, Kathleen H. Besinque, University of Southern California, Brian S.
Henriksen, Creighton University, Ana Hincapie, California Northstate University, Luke E. Rice, Washington State University, Deborah A. Sturpe, University of Maryland, Terri L. Warholak, The University of Arizona. Objectives: The Taskforce was charged with identifying successful consortia in the academy and best practices from such consortia, as well as making recommendations for identifying expertise within the academy and disseminating that information. Method: The group identified experiential and educational consortia in the U.S. and will gather qualitative data via structured interviews with members. Additional qualitative and quantitative data will be gathered via national survey and systematic interviews to determine best practices. In collaboration with AACP staff, and input from Sections and SIGs a comprehensive list of expertise categories has been developed. Suggested changes to AACP web-based member profiles include additional fields to gather expertise and consortia participation data using standardized expertise categories. Results: A previous survey identified 24 experiential consortia and participating institutions. Best practices from these consortia will be presented at the conference. A list of 166 expertise categories was developed and grouped into five categories: 1) Administrative, 2) Biomedical Sciences, 3) Clinical/Pharmacy Practice, 4) Educational, and 5) Social Administrative Sciences. Additional fields added to the member profile will allow members to upload CV, include links to external professional sites such as LinkedIn, indicate participation in consortia, and select from standardized expertise categories. AACP members and staff will be able to search the database using standardized expertise terminology. Communication strategies have been discussed with AACP staff to inform members about profile improvements and to encourage profile updates. Implications: The Taskforce work will lead to improved capability to identify expertise in the Academy and facilitate member collaboration.

Improving the First Offering of an Infectious Disease Module that Utilized Flipped Classroom. Angel M. Beck Kimble, Marshall University, Justin T. Williams, Marshall University, Timothy E. Long, Marshall University. Objectives: To determine if application of a distinctive coding mechanism for exam questions in our School of Pharmacy’s learning management system and exam software (Blackboard) would be beneficial for the newly offered infectious disease module that was employing a flipped classroom model. Method: Each exam question was assigned a unique coding mechanism to input into Blackboard with the question content. The coding mechanism was designed to help ensure that individual class objectives and overall course objectives could easily be tracked. Plus, we could then use this information to map to our School of Pharmacy’s terminal learning outcomes for curriculum mapping in the future. Results: Overall, we found the unique coding mechanism to serve more roles than initially intended. One of the first initial discoveries was that the coding of the questions in Blackboard helped to easily identify areas of concerns with balancing exam content by assessing different levels of Bloom’s taxonomy. Implications: The course was team taught and the unique coding helped all faculty involved to more easily examine the level of questions as it correlated to Bloom’s taxonomy. It helped with discovery and ensuring that future exams were more balanced to include an equal sampling of simple knowledge, comprehension, and application questions on the assessment. Plus, we discovered that the coding mechanism assisted faculty to continually and consistently stress not only individual class objectives but overall course objectives with students.

Optimizing Team Building in TBL: Days 1 through 100. William Ofstad, California Northstate University. Objectives: This aim of this project was to create a literature-guided model timeline of simple and time effective team building and assessment activities that develop high performing student teams in a team-based learning (TBL) classroom. Method: A literature review of team building, team contracts, TBL, and peer evaluation was performed to identify best practices and common implementation barriers to team performance. Time and implementation difficulty was assessed for proposed methods in order to develop this model timeline. Results: A 100-day timeline and supporting materials was developed with procedures for team formation, team contracting, formative and summative peer evaluation and role in gradebook, conflict resolution strategies, and managing disruptive or poor performing students. The principles of team diversity, shared mental models, trust, and mutual performance monitoring were key areas of focus to reach higher performing teams. Scaffolding was used to determine time intervals of activities. Michaelsen, Fink, and Koles provided methods for peer evaluation. Where published methods were unavailable, TBL classroom best practices shared by the author and other members of the Team-Based Learning Collaborative were offered. Implications: Faculty who teach with teams are challenged with team formation, ensuring individual and team performance, fostering meaningful feedback, and managing conflict. Small group pedagogical systems like PBL manage these challenges by assigning one facilitator per team. TBL requires a more systematic approach with fewer facilitators in each classroom. Through a structured series of team building and assessment activities, these challenges will be reduced. This model may also lead to a more effective classroom and greater student engagement.

Pharm to Farm: a novel APPE delivering on-site farmstead medication assessment to rural Missourians Kelly A. Cochran, University of Missouri-Kansas City, Karen Funkenbusch, University of Missouri – Kansas City. Objectives: Pharmacy students seek opportunities to return to their rural community and develop clinical pharmacy services. On-site farmstead visits equip advanced pharmacy practice experience (APPE) students with skills to enhance and optimize farmers’ medication management, prevent injury resulting from medication misadventures, educate about disease states, and provide disease state screenings. Method: Pharm to Farm is four week APPE in which pharmacy students conduct pre-visit phone assessment with the patient and pharmacy. They prepare for the visit by determining the most appropriate patient education materials that will be needed. During on-the-farm visits students perform Medication Therapy Management interviews, physical assessment and health screenings. Delivery of patient-centered care is achieved through assessment of adherence, health literacy and risks of medication-related agricultural injury. Pharmacy students document their recommendations in a letter to the farmer and SOAP note to the physician. Results: APPEs educate and empower rural patients to engage in their healthcare. Pharm to Farm equips APPEs to meet the challenges of healthcare delivery in an agricultural community. Implications: This APPE provides pharmacy students with opportunities to apply clinical, communication, and practice management skills through on-the-farm visits while enhancing their appreciation for the culture of agriculture; thereby equipping them to successfully care for their future rural patients. By partnering with rural organizations or Extension services, this mobile practice site model can be implemented effectively in other rural communities.

The Development of a Novel Faculty Mentoring Family Program. Janelle Mann, Jamie Pitlick, St. Louis College of Pharmacy, Jacklyn Harris, St. Louis College of Pharmacy, Matthew Pitlick, St. Louis College of Pharmacy, Julie A. Murphy, The University of Toledo, Amie D. Brooks, St. Louis College of Pharmacy. Objectives: To describe the development of a unique and innovative faculty mentoring
An Administrative Model to Coordinate Threads through the Curriculum. Kristin K. Janke, University of Minnesota, Anne M. Schullo-Feulner, University of Minnesota, Shannon L. Reidt, University of Minnesota. Objectives: 1) to create a mechanism for coordinating the development of competencies that are threaded through all four years of the curriculum, 2) to support prioritization of effort, innovation and scholarship within these threads. Method: Curricular competencies were clustered into six major Domains: 1) Patient Care, 2) Population Health, 3) Health Systems Management, 4) Leadership & Engagement, 5) Professional & Interprofessional Development and 6) Scientific Inquiry/Scholarly Thinking. Leads were identified and a job description was developed with responsibilities similar to a course director. Beginning, Intermediate and Advanced Levels of Mastery were defined for each Domain. Annually, Domain Leads identify an area for concentrated curriculum development and scholarship effort. Results: The Patient Care Domain has prioritized Patient Care Documentation (PCD). Faculty teaching PCD have been interviewed and a sequenced plan for PCD instruction and student learning assessment has been outlined for each semester. A proposal has been written for resources to support innovations and related scholarship around the use of student peer review in PCD. In addition, the Scientific Inquiry Domain has prioritized Evidence Based Medicine (EBM). This has included convening clinical faculty, a librarian and an assessment expert to design a new end-of-year EBM curricular assessment, with the goal of disseminating results in the EBM teaching literature. Efforts to recognize domain lead workload are ongoing through discussions with Department Heads and alterations to the annual workload reporting system. Implications: As curricula increase in complexity, mechanisms are needed to coordinate the delivery and assessment of competencies across the curriculum.

An Instrument to Assess Student Experience with Tablet-based (iPad) Assessments. Graciela M. Armayor, Nova Southeastern University, Sean Leonard, Nova Southeastern University, Jennifer Steinberg, Nova Southeastern University. Objectives: To expand the Attitude Towards Computerized Assessments Scale (ATCAS) for use in assessing student experience with tablet-based assessments (TBA) using iPads. Method: The Attitude Towards Computerized Assessments Scale (ATCAS), a psychometrically sound instrument previously used to assess ease of use and confidence with the use of computer-based tests, was modified to evaluate student reactions towards TBA. New items were added to the ATCAS that were specifically related to TBA. The internal consistency of the modified instrument was evaluated using data collected from 238 first-year pharmacy students who completed 17 TBAs over the course of a semester. Results: Both of the original scales on the ATCAS were found to demonstrate moderate to high level of internal consistency. The Ease of Use factor, which is comprised of 8 items, yielded an alpha coefficient (α) of .896. The Confidence Factor, which is comprised of 5 items, yielded an alpha coefficient (α) of .754. The newly developed Perceptual Reaction Scale, comprised of 11 items specifically assessing experiences with TBA, yielded an alpha coefficient (α) of .578. Implications: This research supports that the ATCAS is a sound measure for assessing student experiences with tablet-based testing. The addition of the Perceptual Reaction Scale adds useful information for deriving student experiences that are specifically related to TBA.

Analysis of STE(A)M-summer Curriculum on Minority High Schooler’s ACT Performance for Admissions to Pharmacy School. Kimberly L. Simmons, St. Louis College of Pharmacy, Scott K. Griggs, St. Louis College of Pharmacy, Steven T. Player, Barnes-Jewish Hospital. Objectives: The BEST Summer Pharmacy Institute is
a community partnership—between Barnes Jewish Hospital, Express Scripts Inc., and the St. Louis College of Pharmacy—formed to expose and prepare local underrepresented minority (URM) high school students for careers in pharmacy using a STE(A)M-based curriculum. The 6-week summer program offers STE(A)M academic preparation with college credits, ACT preparation, and pharmacy college tours. The objective of the study is analyze the impact of participation in the summer program on ACT performance for qualification of URM students admissions into (pre)-pharmacy programs and college. Method: A retrospective data analysis was conducted on the 2008–2012 high school senior program participants (N=60). Senior program participants were invited to complete a voluntary survey between December and May to capture college applications, acceptances, matriculation decisions, scholarships received, and major declaration. Results: Across all years, 97 percent (N=58) of high school senior program participants completed the survey, were accepted to at least one college, and self-report current college enrollment. Utilizing a minimum ACT requirement of 23 composite, the average reported ACT score was 25.21, and 60 percent (N=35) achieved ACT scores meeting minimum admissions criteria. Eighty-six percent (N=50) of the students declared an interest in a STE(A)M-based professions. Over one-third (N=22) of students enrolled into a (pre)-pharmacy school or declared pharmacy/pre-pharmacy as their concentration. Implications: A community partnership offering a STE(A)M-focused summer pipeline program can provide the academic preparation, interest, and understanding of the health care careers to bridge the disparity of diversity within the profession of pharmacy.

Are We Measuring Up? A Leadership Development Needs Assessment of Pharmacy Practice Managers. Keysa L. Bryant, Palm Beach Atlantic University; Carmela Nanton, Palm Beach Atlantic University. Objectives: To determine what current and future pharmacy managers need to develop and sustain their leadership development; and how pharmacy, academic and health service institutions can help in the process. Method: Thirty-one (31) question electronic survey distributed to over 300 pharmacy managers, leaders, and owners accessed from professional societies, pharmacy practice leaders, higher education and healthcare systems. Results: The survey sample of respondents n = 69, representing a 23.5% response rate, 50(72.5%) of the respondents completed the entire survey. Demographic findings included participants with an age range of 20 through over 50 years of age, with 2/3 of participants 40 years and older. The study sample consisted of 43.9% females and 57.1% males. Effective communication was the most reported leadership development need followed by human resource development and training and orienting employees. Most respondents reported being proficient in project management with less proficiency being shown in finance and budgeting. Twenty-seven percent reported not having any leadership development support at their place of employment. Implications: Implications for leadership development in pharmacy practice requires moving beyond current curricula and infusing competencies into continuing education and employer funded development. Leadership development prior to entering the workforce as well as opportunities throughout the practitioner’s professional career will decrease the amount of turnover in leadership positions. Ongoing needs assessment in leadership is imperative in developing current and future leaders.

Assessing Nutrition Knowledge in Future Healthcare Professionals. Johanna N. Peragine, Amanda C. Zale, Terri L. Warholak, The University of Arizona. Objectives: The purpose of this study was to obtain a baseline measure regarding basic nutritional knowledge of incoming first year medicine, nursing, and pharmacy students. Authors hypothesized that nursing students would have the most developed reference of nutritional information since admissions to their college requires a nutrition prerequisite course. Method: At the beginning of the 2013 school year authors surveyed 244 subjects at the University of Arizona, comprising of 47 nursing, 96 pharmacy, and 101 medicine students. A descriptive study was performed using a cross-sectional, print-based questionnaire containing 3 descriptive and 14 multiple-choice questions designed to assess subjects’ nutritional knowledge. Completed questionnaires were scored out of 21 points and average scores with standard deviations were tabulated. Each college’s total scores were compared to one another using chi-square analysis. The a priori alpha level was 0.05, with a Bonferroni correction of 0.016. Results: The overall questionnaire response rate was 90%: 84% from the College of Medicine, 96% for the College of Pharmacy, and 94% for the College of Nursing. The average questionnaire scores per college were: 6.50 ± 1.76 for medicine, 5.88 ± 2.00 for pharmacy, and 5.72 ± 2.08 for nursing. A chi-square analysis showed no significant difference in scores between groups; p = 0.04. Implications: Results showed no difference between nutritional knowledge levels amongst the 3 disciplines. However, the low average questionnaire scores reflect a lacking knowledge base and suggest the need to re-evaluate curricula.

Assessing Impact of Identifying Pharmacy Student’s Strengths to Build Better Leaders and Create Effective Teams. Barbara M. Kelly, Palm Beach Atlantic University, Jamie L. Fairclough, Palm Beach Atlantic University. Objectives: Pharmacy students may be unaware of their personal strengths and thereby not know how to utilize them effectively in a leadership capacity or in creating and functioning in a team environment. This study was designed to raise awareness of the importance of students knowing his or her strengths with the intent to become better leaders, team builders and team members. Method: Second professional year doctor of pharmacy students were enrolled in a Professional Development II course. Each was provided a complimentary book entitled Strengths Based Leadership, Tom Rath and Barry Conchie, co-authors. During this course, students completed the assessment contained in the book to identify their Signature Strengths®. Students were provided the results of their assessment and were given two different opportunities in two separate classes to utilize their own Signature Strengths® in a team setting. Students were surveyed prior to and upon successful completion of the course. Statistical analyses of the survey data were performed with the Wilcoxon Signed-Rank test using SPSS v.22. Results: There was a statistically significant difference in the students’ perception and utilization of their individual strengths before and after the course (p<0.001). Specific factors in the instrument, such as leadership and collaboration, were also significant. Implications: Helping students identify their Signature Strengths® may provide them with a distinct advantage toward becoming better leaders, being better equipped to create effective teams, and becoming effective interprofessional collaborators.

Assessing the Impact of a Formal Pharmacy Student Mentor Match Program. Angelica A. Costanzo, Palm Beach Atlantic University, Barbara M. Kelly, Palm Beach Atlantic University, Tara Kuhn, Palm Beach Atlantic University. Objectives: All pharmacy students need a mentor but may not know how to initiate a mentor-mentee relationship. Re- alizing the desire of some faculty to mentor students and the students need for guidance, a mentor match program was developed to connect the two groups. The purpose of this study was to assess if either group benefited from the mentor match program and the accuracy of the
match. **Method:** An initial survey was given to second professional year doctor of pharmacy students in the spring semester to determine their area of interest and potential career path. Students were matched with a faculty member based on this information and the faculty member’s area of expertise. A follow-up survey was administered in the spring semester of the third professional year to both mentors and mentees to assess the outcome of the program. Statistical analyses of the survey data were performed with the Mann-Whitney U test using SPSS v.22. **Results:** Both mentors and mentees benefited from the mentor match program. Both groups were satisfied with the accuracy of the match. The mentor-mentee relationship pushed the student to strive towards his or her career goals. **Implications:** Offering second professional year pharmacy students a faculty mentor in their area of interest may guide them in the selection of advanced pharmacy practice experiences; assist in the selection of a specific career path; support them in their career decision-making; and provide them with the tools they need to achieve their professional goals.

**Assessment of Health Profession Student Perceptions of Interprofessional Education.** Mary E. Kiersma, Manchester University College of Pharmacy, Veronia Guirguis, Manchester University College of Pharmacy, Dawn LaBarbera, University of Saint Francis, Deb Poling, Indiana-Purdue University Ft Wayne, Mindy Yoder, University of Saint Francis. **Objectives:** To assess health profession students’ perceptions of interprofessional education (IPE) using the theory of planned behavior. **Method:** An assessment was distributed to health profession students (N=129) prior to and upon completion of an IPE series consisting of three sessions over an academic calendar year. The 42-item survey contained questions regarding the Theory of Planned Behavior (e.g. attitude, subjective norm, perceived behavioral control) and demographics (e.g. gender, ethnicity). Theory of planned behavior was used as a framework for 38 questions pertaining to students’ perceptions of interprofessional education. Questions were developed integrating outcomes from each session as well as the Core Competencies for Interprofessional Collaborative Practice. A five point Likert scale (1=strongly disagree to 5=strongly agree) was used to determine factors affecting perceptions. Descriptive statistics and paired t-tests were performed in SPSS using α = 0.05. **Results:** One hundred and twenty seven participants completed both assessments (response rate= 98.4%). Thirty five of 38 theory of planned behavior questions were statistically significant (p<0.05). Students indicated their ability to collaborate with other healthcare professionals (p<0.001, attitude), felt expected to employ therapeutic communication skills within an interprofessional team to convey necessary information (p=0.001, subjective norm), and could employ therapeutic communication skills within an interprofessional team to convey necessary information (p<0.001, perceived behavioral control). **Implications:** Health professionals are often involved in interdisciplinary teams after graduation; however, many are not educated in a collaborative learning environment. Integrating interprofessional education offers opportunities to improve communication between healthcare practitioners, modify attitudes and perceptions, and enable enhanced collaboration to improve patient care.

**Assessment of Students’ and Professors’ Attitudes on Use of Technology at a School of Pharmacy.** Jonathan Dorph, John Fettermann, Duquesne University, Julia Green, Duquesne University, Lauren Lichtenfels, Duquesne University, William Trombatt, Duquesne University, Khalid Kamal, Duquesne University, Kathleen DeRose, Duquesne University. **Objectives:** To assess professors’ and students’ attitudes and beliefs on the use of technology, defined as Personal Response Systems (PRS), iPad/laptop, mobile devices, online databases, Personal Digital Assistants (PDA), and electronic lectures, in the classroom. **Method:** Focus groups were utilized to assess professors’ opinions regarding technology use in classroom. Qualitative analysis was performed to identify common themes. First and fourth professional years pharmacy students were surveyed to assess their opinions and attitudes on technology use in classrooms. Descriptive statistical analyses were conducted using SPSS version 18.0. The study protocol was approved by the investigators’ Institutional Review Board. **Results:** Based on the professors’ responses to a brief survey, two focus groups were created: minimal technology use (n=5) or moderate-high technology use (n=9). Professors perceived that students viewed technology as integral to their learning process, though overuse could inhibit student learning. Another common theme was that professors wanted to connect with their students through the use of technology. 260 out of 324 pharmacy students responded to the survey (response rate: 82.5%). The students believed that the use of technology in classroom, to some extent, helped improve their overall grade (average means: 3.17-4.24) and their classroom learning (average means: 3.47-4.07) when measured on a scale of 1-5 where 1=least helpful and 5=most helpful. **Implications:** Pharmacy students and faculty’s attitudes about the use of technology in classroom could identify the technological disconnect between teacher and student and can provide valuable insight into the optimal use of technology to facilitate the teaching/learning process.

**Assessment of Mentor Involvement with Pharmacy Students Pursuing Post-graduate Residency Training.** Drayton A. Hammond, Marley A. Linder, William B. Cousins, Sandra S. Garner, South Carolina College of Pharmacy, P. Brandon Bookstaver, South Carolina College of Pharmacy. **Objectives:** To elucidate the professional relationships between pharmacy students pursuing post-graduate residency training (PGRT) and their mentors during pharmacy school. **Method:** An IRB-approved survey was emailed in April and May 2013 to deans and faculty members representing all domestic colleges of pharmacy. Survey responses were recorded anonymously using an online survey tool, “SurveyMonkey.” Pharmacy students in the Class of 2013 seeking PGRT were eligible for inclusion. Students assessed their level of satisfaction with mentor activities using a Likert scale (1 meaning strongly agree to 5 meaning strongly disagree), ranked the importance of six pre-identified mentor activities, and indicated their desired relative amount of mentorship with PGRT preparation activities. Demographic data, types of preparation methods, number of mentors, and manner of mentor determination were assessed. Nominal variables were evaluated with descriptive statistics and chi-square or Fisher exact tests when appropriate. **Results:** Two hundred sixty-eight students from 39 colleges of pharmacy responded (matched n=226, unmatched n=42). Compared with unmatched students in 2013, students who matched were more satisfied with mentorship on preparation of a curriculum vitae (p=0.026), interviews (p<0.0001), regional and national meetings (p=0.047), programs to apply (p=0.0002), and rank list determination (p=0.03). The matched group found mentorship with curriculum vitae preparation (p=0.008) and programs to apply (p=0.0075) more important than unmatched students. There were no statistically significant differences in the preparation methods, number of mentors, or manner of mentor determination between groups. **Implications:** Pharmacy students pursuing PGRT who matched perceived more value from a mentor-protégé relationship than unmatched students.

**Best Practices in Health Disparities Education: A Pilot Test.** Margarita Echeverri, Xavier University of Louisiana, Shin-Yu Lee, St. Louis College of Pharmacy. **Objectives:** To pilot-test a protocol for
evaluating best practices in teaching methods, assessment, and interventions in health disparities education. **Method:** A protocol was developed by the AACP-SIG in Health Disparities and Cultural Competence (HDCC) to evaluate evidence of best practices in HDCC educational interventions for health-related professions in multiple HDCC areas. Pilot-testing the protocol, team members conducted a preliminary literature search in the area of teaching health disparities and independently reviewed the articles to determine if they met inclusion criteria (i.e., types of educational interventions and learning outcomes). After achieving agreement about studies included, team members independently performed a critical appraisal of evidence using 3 rating scales: Magnitude of Evidence, Quality of Instruction, and Strength of Results. Team members discussed the utility of the protocol and identified areas requiring further clarity and improvements. **Results:** A total of 19 articles were retrieved for the pilot test; six of them met criteria for appraisal and two were rated as best practices (curricular recommendations by a task-force, and curriculum implemented in medical school). After discussing differences in the rating of additional articles, reviewers suggested revising the protocol to include examples of “promising” practices meaning practices that score high on the Quality of Instruction scale but low on any of the other two scales. **Implications:** The protocol, with recommended revisions to include promising practices, was found to be appropriate for conducting the review, appraisal, and determination of effective methods to teach health disparities in health-related professions that could be easily incorporated into pharmacy education and practice.

**Challenges and Successes of Twenty Years of Pharmacy Education in the Palestinian Territories.** Ayman Hamouda, Texas A&M Health Science Center, Rabaa Al-Rousan, Texas A&M Health Science Center, Fadi M. Alkhateeb, Texas A&M Health Science Center. **Objectives:** To provide high-level synopsis of Pharmacy Education in the Palestinian Territories (PT; East Jerusalem, West Bank and Gaza Strip) **Method:** Palestinian Territories pharmacy programs were evaluated based on published literature, programs’ websites, as well as contacting programs’ current and past faculty and students **Results:** Every year >500 students are admitted into Bachelor of Pharmacy programs at Al-Azhar, An-Najah and Al-Quds Universities or Pharm D programs at An-Najah and Birzeit Universities. Admission is based solely on the General Secondary School Examination (Tawjihi) scores and little consideration is given to non-academic criteria. Bachelor of Pharmacy programs (5 years; 160-180 Credit Hours) consist of 73-81% basic sciences, ~13% pharmacy practice and <10% administrative and experiential education courses and 720-1440 hours of community pharmacy training. The Pharm D programs include basic sciences (~75%) and clinical (~25%) courses, >1000 hours of community pharmacy training and an additional (6th year) of pharmacy clerkships **Implications:** Pharmacy Education in the PT represents a unique case study. Up till 1992, there was not a single college of pharmacy in the PT and pharmacies relied on pharmacists educated abroad and registered in neighboring counties. Now, the number of pharmacy graduates from PT universities exceeds market demand. Although, these programs are accredited by the Palestinian Ministry of Higher Education, their curricula are clearly focused on basic sciences and short in clinical, administrative, and experiential courses. This reflects the shortage in academic and research resources and the inability to attract qualified personnel and well-trained clinical faculty due to the ongoing Israeli-Palestinian conflict.

**Collaborative Exam Item Review in a Team-taught Self Care Sequence.** Adam Pate, The University of Louisiana at Monroe, David J. Caldwell, The University of Louisiana at Monroe, Laurel L. Sampognaro, The University of Louisiana at Monroe. **Objectives:** To improve exam item quality by educating and involving course instructors in evidence-based item review and encouraging use of this process in future courses. **Method:** Instructors completed an item-writing related presurvey. Training and review panels were held before each of the six exams in this two-course sequence. Item difficulties and discrimination values were calculated for each course and compared to the previous year’s offering of these courses. Items were also classified into groups based on difficulty and discrimination per Haladyna 2004 and compared to those of the previous course offerings. Instructors completed follow-up post-surveys at the end of each course. **Results:** Subjective feelings of confidence and success in item writing increased between the pre- and post-surveys (6.0 to 8.1, p = 0.002; and 6.4 to 7.9, p<0.001, respectively). Confidence in the ability to peer-review test items (6.7 to 8.4, p = 0.005) and to implement a formal item evaluation process (5.5 to 7.1, p = 0.008) also increased. Item analysis failed to show a statistically significant difference between the reviewed and non-reviewed items (mean difficulty 84.4% and 86.3% and discrimination 0.247 and 0.225, respectively), although item classifications by group did improve (p = 0.01). **Implications:** This method of review positively affected instructors’ perceptions of item-writing confidence and success and improved self-rated opinions of ability to edit items and train others to do so. Item statistics did not change significantly, but edited items distributed more favorably into item statistic-based classifications.

**Comparison of First and Third Year Students’ Awareness about Online Pharmacies.** Karishma Desai, Betty A. Chewning, University of Wisconsin-Madison. **Objectives:** There are over 40,000 online pharmacies, many of which don’t meet National Association of Board of Pharmacy (NABP) guidelines. This study compared first and third year students’ on their: • Awareness of online pharmacy prevalence. • Ability to distinguish Recommendable vs. Not-recommendable online Pharmacies based on NABP guidelines. **Method:** First and third year PharmD students completed an online survey assessing their awareness on presence, use and national efforts in educating public about online pharmacies. The students were also presented a hypothetical scenario and were required to recommend one website out of four to test their ability to differentiate pharmacies based on NABP guidelines. Fisher Exact test compared group differences. **Results:** A total of 67(58%) 1st year students and 108(82%) 3rd year students participated in the survey. Only about 5%(n = 3) of 1st year and 8%(n = 9) 3rd year students were moderately or very aware of online pharmacy prevalence. Third year students were significantly (p = .002) more aware of the prevalence of online pharmacies than were 1st year students. Only 46%(n = 31) of 1styear students versus 69% (n = 74) of 3rdyear students identified a recommendable online pharmacy based on NABP guidelines (p = .004). Student prevalence awareness was significantly associated with ability to distinguish recommended pharmacies (p = .027). **Implications:** Although there were substantial differences in first and third year students’ knowledge about online pharmacies, a large percent are both unaware of the prevalence and guidelines to differentiate recommendable and non-recommendable online pharmacies. Given the prevalence and growth of online pharmacies, educational modules about online pharmacies are needed in PharmD curricula.

**Comparison of K-Type to True/False Structured Questions Administered to Doctor of Pharmacy Students.** Scott A. Baggary, The University of Louisiana at Monroe, Jeffery D. Evans, The University of Louisiana at Monroe. **Objectives:** The objective of this project is to compare the effectiveness of K-type questions in comparison to
individual true/false questions. We intend to determine if pharmacy students perform better on K-type questions or true/false questions. **Method:** The School of Pharmacy has a two semester series of Pharmacy Law and Ethics courses. A pool of 10 K-Type questions was developed, with one control question from an unrelated topic. From each K-type question, three parallel true/false questions were derived. Two forms of the test instrument were developed, each with 5 randomly-selected K-type questions. In addition, Form A was assigned true/false questions derived from K-type questions of Form B, and Form B was assigned true/false questions derived from K-type questions of Form A. The instruments were administered to students in both courses. Item statistics were tabulated and statistical analysis was performed using an analysis of variance model. **Results:** The instrument was completed by 85 students in the first course and 82 students in the second course. Overall scores differed by class, with 58.1% correct for the first course and 48.1% for the second course (p = 0.021). In the pooled analysis of items, students scored higher on true/false items than K-type items (66.4% vs. 39.9%; p < 0.001), and higher on course-related items than control items (59.1% vs. 29.3%; p = 0.004). No significant difference was noted in RPB values based upon question type. **Implications:** Our data demonstrate that students have lower scores on K-type questions compared to true false questions, though a significant difference in RPB was not found.

**Comparison of Student’s Confidence in Cultural Competence: Knowledge Between a Lecture/Laboratory Versus Lecture Alone.** Jennifer N. O’Callaghan, Purdue University, Kimberly S. Plake, Purdue University. **Objectives:** To compare student pharmacists’ confidence in communicating with patients of different backgrounds through a lecture or combined lecture and laboratory class. **Method:** First year student pharmacists self-assessed their confidence in their knowledge of cultural issues in health care and communication with patients of diverse backgrounds using a 20-item anonymous survey. Students assessed their confidence utilizing a 5 point Likert scale. Students completed the survey following a lecture or combined lecture and laboratory on cultural competence. T-tests and ANCOVA were performed to compare the retrospective pre- and post- tests. **Results:** Student responses were received from 147 and 159 students in lecture and combined lecture and laboratory classes, respectively. Responses to all survey items improved (P < 0.05) from retrospective pre- to post-test in both lecture and laboratory classes. Statistical differences were seen across retrospective pre- to post-changes in 5 of the 20 questions when comparing the two teaching methods. Students in the lecture and laboratory demonstrated improved confidence in knowledge of “lay” theories of illness, procedures to use an interpreter, understanding of the role of the family in decision making, and comfort in interacting with people of diverse backgrounds. Students receiving only the lecture showed larger improvements in their confidence in caring for a non-English speaking patient. **Implications:** Teaching cultural competence through lecture or laboratory improved students’ confidence in their awareness and skills pertaining to cultural competence and cross-cultural communication. Differences in learning outcomes may be observed based on lecture or laboratory-based teaching methods.

**Consideration of Pharmacy Program Quality Indicators.** Earle W. Lingle, South University, Curtis E. Jones, South University, Kelly J. Clark, South University, Robert Vaughn, South University. **Objectives:** The ACPE Board of Directors has established policy that accredited programs must disclose program quality information to the public. The purpose of this study is to provide a contextual assessment of on-time graduation rates provided by pharmacy programs on their websites. **Method:** Websites of 115 pharmacy programs having graduates and NAPLEX results were reviewed in February 2014. Data required by ACPE were collected including the first-time NAPLEX pass rates, on-time graduation rates, and a third quality indicator selected by each pharmacy program. **Results:** 107 websites had accessible data. The remaining eight programs were contacted and four provided information regarding website location of the data or directly provided the requested information. The mean on-time graduation rate was 89.8% and the mean NAPLEX first-time pass rate was 96.6%. Twenty-three (20.7%) programs had on-time graduation rates lower than 85% (range = 65.0% to 84.7%). Nine (8.1%) programs had first-time pass rates below 90%. The average NAPLEX pass rate equaled 96.3% (range = 84.0% to 100.0%) for programs with on-time graduation rates below 85% and 96.8% (range = 86.9% to 100.0%) for the remaining programs. The third quality indicator most frequently posted included MPJE pass rates, residency matching rates, employment statistics, student satisfaction results, or pass rates on progression exams. **Implications:** NAPLEX pass rates were similar for schools whether above or below the 85% on-time graduation rate. On-time graduation rates may be helpful to potential students, but may not be a predictor of program quality in the absence of NAPLEX pass rates.

**Design of a Learning Module on End-of-Life Care for Third-Year Pharmacy Students.** Cara McDermott, University of Washington, Dana P. Hammer, University of Washington. **Objectives:** Develop a module on end of life (EOL) care for third-year pharmacy students. The timing of the module complemented discussion of oncology and pain management to incorporate social and behavioral content into a required therapeutics course. We also evaluated the lecture’s short-term impact on students’ attitudes about and perceived knowledge of EOL care. **Method:** A graduate student, who is also a registered pharmacist with EOL experience, designed and taught a lecture with faculty mentorship. We utilized a primary literature review and materials from multiple organizations to design lecture objectives which included ability to explain hospice benefits, structure, eligibility, and resources, plus the appropriate use of medications commonly encountered in EOL settings. The lecture was first delivered in 2012; after receiving student feedback, we included additional case-based examples and regulatory information. **Results:** We measured students’ knowledge of and attitudes towards EOL care with anonymous online surveys administered before and after each of the lectures. Following both lectures, students reported increased familiarity with hospice and improved confidence in delivering care in EOL settings, a majority of students reported that one lecture on EOL was sufficient while others thought more EOL should be in the curriculum. **Implications:** The learning module of lecture with case studies increased students’ perception of their preparedness related to EOL care, as well as perceived knowledge and skills to use in future practice. Students requested more case studies and applied examples in future lectures; the module is a successful example of integrating social/behavioral content into traditional therapeutics courses.

**Design, Implementation, and Evaluation of a Self-Awareness Focused Contemporary Pharmacy Practice Course.** Nicholas Hagemeyer, East Tennessee State University, Sarah T. Melton, East Tennessee State University, L. Brian Cross, East Tennessee State University. **Objectives:** Foster personal and professional development through implementing a 1st-professional year course focused on increasing student self-awareness related to themselves, their chosen profession, and their future careers. **Method:** Eighty-nine students enrolled in a required 2-credit hour Contemporary Practice of Pharmacy I course during the Fall 2013 semester. Course content aligned closely with the CAPE 2013 Self-Awareness subdomain. Topics
Determined Perceived Stress Levels, Triggers, and Coping Mechanisms for Faculty, Students, and Staff. Charles R. Phillips, Drake University, Renae J. Chesnut, Drake University. Objectives: To compare stress and social support between pharmacy and health sciences students, staff and faculty and understand triggers and coping mechanisms in these individuals. Method: Validated measures of perceived stress, interpersonal support, as well as demographic and other data directed at identifying triggers and coping strategies, were measured for all faculty, staff and students in the fall of 2013. On-line survey responses were anonymous. SPSS was used for descriptive statistics, correlations of stress, social support, and outside work, and for ANOVA between all years of students, faculty, and staff. Results: Usable responses totaled 432. Response rates for staff, faculty, and students were 81.3%, 72.5%, and 41.9%, respectively. Fourth year professional students had lower perceived stress than other pharmacy and pre-pharmacy students, and first year health sciences undergraduates. No other groups differed. Perceived stress was correlated with social support (-0.475, p<.01) and the number of hours employed by students (0.121, p=.041). Faculty and staff cited work/employer demands as the biggest factors increasing stress, followed closely by both financial concerns and family/relationship problems. Similarly, students most cited required coursework, followed by financial concerns and family/relationship problems. Coping strategies most often used by students were spending time with family and friends, followed by listening to music and sleeping more. Faculty and staff also most often coped by spending time with family and friends, followed by exercising. Implications: The results allow the college to better understand stress levels, factors, and coping strategies that can lead to curricular and work modifications to decrease stress.

Developing Best Practices for Instruction in Cultural Competence: A Pilot Project. Margarita Echeverri, Xavier University of Louisiana, Aleda M. Chen, Cedarville University. Objectives: To develop and pilot-test a protocol for evaluating the evidence regarding best practices (BP) in health disparities and cultural competence (HDCC) educational interventions for health-related professions. Method: An intensive literature review found a lack of BP for teaching HDCC. Members from the AACP HDCC-SIG created and submitted a protocol for evaluating BP to the Best Evidence Medical Education organization. The protocol was pilot-tested by 1) conducting preliminary literature reviews in different HDCC topics, 2) evaluating if studies found met protocol-defined inclusion criteria, 3) extracting data from studies to assess evidence, and 4) appraising studies’ level of evidence. Members also reported challenges in protocol application. Results: In the pilot test, 112 articles were retrieved and classified by topic (health disparities, religion/spirituality, sexual/gender orientation, physical disabilities, race/ethnicity, origin/culture, language, health literacy, gender, and age). A total of 31 articles met inclusion criteria and underwent critical appraisal of evidence using three rating scales (Magnitude of Evidence, Quality of Instruction, Strength of Results), but only 7 articles were recommended for BP. Many articles evaluated HDCC concepts but did not include educational interventions and/or assessments. Reviewers found the protocol useful to identify BP but recommended creating a flowchart to summarize the steps in the protocol, defining BP levels of evidence versus promising practices, and creating a combined rating scale. Implications: Results of this pilot project allowed the identification of challenges in appraising evidence, as well as the need to develop different criteria to appraise studies focused on assessing the level of cultural competence instead of teaching interventions.

Effects of Standard versus Nonstandard Multiple-choice Question Formats on Student and Item Performance. David J. Caldwell, The University of Louisiana at Monroe, Adam Pate, The University of Louisiana at Monroe. Objectives: To determine the effect of four test item format deviations on test item statistics and student performance. Method: Twenty pairs of directly comparable multiple-choice (MC) test questions were written to adhere to (standard scale) or deviate from (nonstandard scale) four specific item-writing guidelines. Mean differences in item difficulty and discrimination were measured between the two scales as a whole and for each guideline individually. Results: The nonstandard scale was 12.7 percentage points more difficult than the standard (p=0.03). Point biserial correlations were not significantly different between the two scales (p=0.44). Analyses by individual guidelines failed to identify statistically significant results for all but one guideline: avoid “none of the above”—nonstandard sub-scale 24.6 points more difficult (p=0.047) with no difference in discrimination (p=0.22). Implications: Nonstandard test items were more difficult than the standard scale versions without the benefit of increased discrimination. Item-writing guidelines should be considered during MC test construction.

Enhanced Student Awareness and Recognition of Scholarly Teaching. Mary E. Kiersma, Manchester University College of Pharmacy, Aleda M. Chen, Cedarville University, Elizabeth W. Blake, South Carolina College of Pharmacy, Maureen E. Knell, University of Missouri-Kansas City, Nicholas M. Fusco, University at Buffalo, The State University of New York, Erikla L. Kleppinger, Auburn University, Freddy M. Creekmore, East Tennessee State University, Marc E. Gillespie, St. John’s University, Vicky Mody, South University. Objectives: To evaluate 1) the process, evidence, and criteria used to select teacher of the year and 2) perceptions of best practices in scholarly teaching. Method: A sample of AACP members were invited to complete a 14-item online survey instrument, developed from a review of the literature, containing questions regarding evidence used to support teaching award nominations, established criteria for teaching awards, and thoughts on best practices for evaluating scholarly teaching. The instrument also examined the number of teaching awards, the process used to determine award recipient, and the method.
for nomination. Descriptive statistics and frequencies were performed using SPSS v21.0. **Results**: Of 130 invitations, 58 responses (44.6% response rate) were collected. Of the 58 respondents, 48.3% (n=28) were from public institutions, 67.2% (n=39) were part of administration, 84.5% (n=49) recognized teaching excellence, average of 4 teaching awards (range 2-6). Most institutions (41.4%, n=24) do not use a rubric to determine teaching awards. Evidence used to support nomination included nomination letters (31%), student evaluations (31%), and student support letters (25.9%). Respondents’ perceptions of evidence that should be incorporated to support nomination included: nomination letters (34.5%), student letters of support (32.8%), descriptions of teaching innovations (31%), and scholarship in the area of education (29.3%). **Implications**: Demonstration of teaching excellence has focused on student evaluations of teaching and nomination letters, but respondents believed other aspects, such as educational scholarship, should be included. By expanding current teaching award criteria to include educational scholarship, schools could promote evidence-based teaching practices, scholarship, and innovations in education.

**Evaluation of Medicare Outreach Project through Student Reflections on Service Learning Experiences**. Benjamin S. Teeter, *Auburn University*, Joshua C. Hollingsworth, *Auburn University*, Salisa C. Westrick, *Auburn University*. **Objectives**: To describe pharmacy student experiences after volunteering at Medicare prescription drug enrollment events through the identification of common themes in written reflections. **Method**: The Medicare outreach project is a collaborative project between Harrison School of Pharmacy (HSOP) and Alabama State Health Insurance and Assistance Program (SHIP) and was launched in 2013. A total of 110 students volunteered in 17 enrollment events in 10 counties. At each event, students interviewed Medicare beneficiaries about their current coverage, conducted prescription drug plan comparisons, explained options, and enrolled beneficiaries. Students who interacted with Medicare beneficiaries wrote a paragraph to reflect on their experience. Reflections were coded independently by the research team using ATLAS.TI and merged for comparison. A final coding scheme was determined through discussion and consensus. **Results**: A total of 80 participating students provided written reflections resulting in 6,866 words or 27.5 pages of text. Overall, 14 sub-themes emerged from the data that fell into 2 categories – benefits to self and benefits to the community. The majority of students felt the outreach project was a great learning experience that allowed them to apply information learned in class in the real world. They described their experience helping patients and the realization of need for programs like this in the community. The most common theme among the students was aspirations for future participation in enrollment events. **Implications**: The program provided benefits to both students and the community and should be sustained in the future.

**Evaluation of Student Expectations of Team Members and Teamwork**. Andrea D. Hopper, Mary E. Kiersma, *Manchester University College of Pharmacy*, Lorin Sheppard, *Manchester University College of Pharmacy*, Aleda M. Chen, *Cedarville University*, Tracy Frame, *Cedarville University*, Rebecca J. Gryka, *Cedarville University*. **Objectives**: Professional schools are starting to incorporate pre-set teams into the curriculum for group projects to prepare students for future teamwork in the practice setting. The objective is to evaluate changes in perceptions about expectations of team members and whether pre-conceived notions affect perceived team functions. **Method**: Students were assigned to teams to achieve diversity after considering demographics (e.g. ethnicity, gender), personality type, learning styles, and StrengthsFinder® data. P1 and P2 students completed an instrument (5-point Likert-type, strongly-agree to strongly-disagree) assessing 1) expectations and perceptions of team members (14 items) pre- and post-fall semester and 2) perceptions of teamwork (8 items) post-fall semester. Descriptive statistics and paired t-tests were performed. **Results**: Students (N=236) completed the instruments. Student perceptions of team member expectations showed significant results in 7 of 14 questions (p<0.05). As the semester progressed, 51% disagreed or strongly-disagreed that they had doubts about the contributions of their team members. Additionally, 61% of students felt their team worked well together. Students also had positive perceptions of teamwork at the end of the semester, with 76% and 81% agreeing or strongly-agreeing that they had higher respect for their team members and that their group was able to work through their disagreements, respectively. **Implications**: Working together in a team setting allows students the opportunity to modify their perceptions of others and of teamwork. Experiencing teamwork in the school setting can prepare students to be successful in future patient care teams.

**Evaluation of a Cultural Competency and Health Literacy Faculty Workshop**. Lourdes G. Planas, *The University of Oklahoma*, Keith A. Swanson, *The University of Oklahoma*, Emily B. Borders, *The University of Oklahoma*, Michelle Lamb, *The University of Oklahoma*, Ann E. Lloyd, *The University of Oklahoma*, Teresa H. Truong, *The University of Oklahoma*. **Objectives**: To evaluate a cultural competency and health literacy (CC&HL) workshop offered synchronously to faculty at two campuses of the University of Oklahoma College of Pharmacy. Participant reports of confidence and desire to teach CC&HL in didactic and experiential courses were compared before and after the 2-hour workshop. **Method**: A one-group pretest-posttest design was used. One week before the workshop, participants received online access to a pretest requesting demographic information, CC&HL teaching experience, and confidence and desire to teach CC&HL. Following pretest submission, participants gained online access to CC&HL information and resources, and were instructed to bring their course materials to the workshop. During workshop breakout sessions, participants generated CC&HL course activity ideas based on Fink’s significant learning domains: foundational knowledge, application, integration, human dimension, caring, and learning how to learn. At the conclusion of the workshop, participants completed a written posttest. **Results**: Forty-six faculty participated in the workshop and completed both surveys. Cronbach alpha estimates for multiple-item survey measures ranged from 0.65 to 0.98. Wilcoxon signed rank tests revealed significantly higher levels of confidence to teach CC (pre = 4.35, post = 9.65) and HL (pre = 5.94, post = 9.87) after the workshop (p<0.001). Participants also reported significantly higher levels of desire to teach CC&HL content in didactic and experiential courses during the next academic year (p<0.01). **Implications**: The workshop was successful based on participant reports of greater confidence and desire to teach CC&HL the following academic year. Future workshops will focus on implementation of CC&HL course activities and input to coordinate advancement across the curriculum.

**Evaluation of Changes in Teamwork Perceptions after Experiencing a Diverse Team**. Andrea D. Hopper, Mary E. Kiersma, *Manchester University College of Pharmacy*, Lorin Sheppard, *Manchester University College of Pharmacy*, Aleda M. Chen, *Cedarville University*, Tracy Frame, *Cedarville University*, Rebecca J. Gryka, *Cedarville University*. **Objectives**: Working in teams during professional school prepares students for collaborating with future team members. The objective is to evaluate whether attitudes and perceptions of working on a team change over the course of a semester. **Method**: To
achieve diversity among the teams, P1 and P2 students were assigned to teams based on demographics (i.e., ethnicity and gender), personality type, and StrengthsFinder® data. Students were surveyed prior to the start of fall semester (when teams were announced) as well as prior to the spring semester. The survey (15 items, 5-point Likert-type, strongly agree- strongly disagree) assessed attitudes and perceptions of working in teams as well as the optimal team diversity. Descriptive statistics and paired t-tests were performed using SPSS v.21.0, with α = 0.05 for statistical significance. Results: Students at two universities (P1 = 122, P2 = 114) completed the assessments. Student perceptions significantly changed on 7 of 15 questions (p < 0.05), and there were no differences between universities. As the semester progressed, more students were unsure or agreed that working in teams consisting of different learning styles (65%) or personality types (68%) improved interpersonal communication. Students also were more likely to agree or strongly-agree that teams can produce excellent outcomes (82%). Furthermore, students were more likely to disagree that they had to assume more work in a team setting (86%). Implications: Understanding the different characteristics that encompass a successfully functioning group can help in designing effective teams. Working in diverse teams can improve team functioning and alter student perceptions and attitudes towards teamwork.

Factors Influencing Mission Trip Participation for Second Year Pharmacy Students. Dana A. Brown, Palm Beach Atlantic University, Jamie L. Fairclough, Palm Beach Atlantic University. Objectives: Because second year pharmacy students do not receive academic credit for participating in medical mission efforts through the Gregory School of Pharmacy, it is important to determine factors that influence student participation, particularly in those students who have received formal educational exposure to medical missions in the pharmacy curriculum, in order to assess if there are methods to increase student participation. Method: Students enrolled in a required second year course covering medical missions were given a survey about factors influencing and deterring participation on medical mission trips. The same survey was administered once the application deadline for trips closed and team selections were determined. Data were collected and analyzed using SPSS v.22. Preliminary analyses were conducted to assess the psychometric properties of the survey. Primary analyses included crosstabulations and the nonparametric McNemar Test. Results: Eighty students (100%) completed both surveys. Based on pre-survey data, 46 students (57.5%) intended to apply for a medical mission trip. However, 26 students (32.5%) actually applied for one of the mission teams, which was statistically significant (p < 0.001). The largest influences (i.e. > 25% response) on student participation included a personal decision/goal, belief in humanitarian acts, and a calling from God. Exposure to medical missions in this course was also an influence. Trip costs and time away from personal obligations were common factors that caused feelings of doubt. Implications: GSOP will continue to include medical missions in our curriculum given its alignment with our mission and vision as well as potential influence on student participation.

Funding Status of Published Pharmacy Educational Scholarship. Spencer E. Harpe, Midwestern University/Downers Grove, Elizabeth A. Davidson, Midwestern University/Downers Grove. Objectives: To examine the presence of funding in published pharmacy educational scholarship (ES) Method: ES was defined as scholarly endeavors examining issues relevant to educating student pharmacists, training practicing pharmacists, or administering such educational programs. All articles published in 2012 from 14 pharmacy journals (2 education-focused and 14 practice-focused) were examined to identify ES articles. Editorials, commentaries, literature reviews, and letters to the editor were excluded. Based on their primary focus, ES articles were classified as general studies about students, evaluations of teaching/learning strategies, student learning issues, program administration issues, or faculty issues. Complete texts were reviewed to determine the presence of funding to conduct the project described in the article. Results: The journal review identified 220 published pharmacy ES articles: 29 (13.2%) general studies about students, 127 (57.7%) evaluations of teaching/learning strategies, 19 (8.6%) student learning issues, 34 (15.5%) program administration issues, and 11 (5.0%) faculty issues. Only 26 (11.8%) articles noted funding sources (general studies about students: 6.9%; evaluations of teaching/learning strategies: 14.2%; student learning issues: 10.5%; program administration issues: 8.8%; faculty issues: 9.1%). The top three funding sources were local institutions [9 (34.6%)], private foundations [6 (23.1%)], and national governmental agencies [5 (19.2%)]. No statistically significant relationship was identified between funding status and article classification. Implications: Pharmacy ES is largely conducted without external funding. Future research should identify the reason behind the seemingly low levels of funding, examine any potential impact on study quality, and compare these findings to ES published in other health professions.

Gender Differences in Student Preconceptions of a Pharmacy Management Course. Jacob T. Painter, University of Arkansas for Medical Sciences, Ashley N. Castleberry, University of Arkansas for Medical Sciences. Objectives: Female enrollment in many Colleges of Pharmacy now numbers that of males. While female employment in pharmacy has grown tremendously over the past two decades, women in pharmacy practice occupy a relatively smaller portion of management positions. Many factors influence this trend, but little attention has been given to the role of gender differences in student perception of management ability. This study examines gender differences in self-rating of management skills prior to a pharmacy management course. Method: Students (n = 82) were asked a variety of questions during the first week of a required Pharmacy Management course in the third professional year. Questions included gender, prior business-related coursework (number of courses, 0-4), self-rating of various pharmacy management related skills (summary index = 0-24), and a pre-test of management concepts (total score = 0-10 points). Results: No significant differences were seen in the number of prior business courses (1.38 vs. 1.13, p = 0.16) or in management pre-test scores (4.9 vs. 4.3, p = 0.13) for males and females; however, a difference was seen in the summary score for management skills (14.3 vs. 12.0). Even after controlling for prior course work and management pre-test scores using linear regression, self-assessment of management skills were lower for female students than for males (beta = -2.12, p = 0.01). Implications: Pharmacy students may have gender biases regarding perceived management skills. Special attention should be paid in PharmD coursework to stress the opportunities for advancement in the profession and to emphasize the application of management skills to all pharmacy practice settings.

Graduate Pharmacy Education’s Association with Improved Health Knowledge and Health Behavior among Students of African Descent. Marketa Marvanova, Chicago State University, Paul J. Henkel, Better Naktende, Athanasios Andriopoulos. Objectives: Our study examines the stroke knowledge and stroke risk-related modifiable health behaviors of pharmacy and non-pharmacy students of African descent to determine if graduate health professions training improved stroke risk knowledge and influenced modifiable health behaviors. Method: We developed a survey instrument that included
Impact of Mental Illness Stigma Awareness Training on Pharmacy Students’ Attitudes. Benita A. Bamgbade, The University of Texas at Austin, Jamie C. Barner, The University of Texas at Austin, Kentya C. Ford, The University of Texas at Austin. Objectives: The goal is to determine if exposure to an intervention course affects pharmacy students’ mental illness stigma. Specific objectives are to determine if there is a difference pre/post intervention in: (1) mental health stigma of depression and schizophrenia; and (2) willingness to engage in mental illness medication counseling. Method: This was a one-group pretest-posttest intervention study of all third year pharmacy students (N=123). The dependent variables were subdomains of stigma (i.e., labeling and stereotyping; separation) and were measured with 28 items on a 5-point Likert scale (1=strongly disagree; 5=strongly agree) using validated survey instruments and researcher created items. Willingness to engage in medication counseling was measured with 4 items using the same Likert scale. The intervention was conducted over two class periods (2.5 hours total) and included a presentation, videos, discussions and active learning exercises on mental illness. Immediately before and after the intervention pre-tests and post-tests were conducted. Data were analyzed using inferential paired statistics and SAS was used to conduct the analyses. Results: Cronbach’s alphas of the sub-domains ranged from 0.66-0.89. Of the responding students (N=88; 71.5% response rate), baseline stigma ranged from 2.41 to 2.74. Labeling and stereotyping stigma significantly decreased pre-post for depression (2.24±0.48; change 0.15±0.40) and schizophrenia Implications: Pharmacy students’ mental illness stigma decreased after completing an intervention course. Additionally, after the intervention course, pharmacy students were more confident, comfortable, interested and likely in providing medication counseling to patients with mental illness. Colleges of Pharmacy should consider including anti-stigma component to current mental health curriculum.

Impact of a Personal Health Behavior Change Active Learning Activity on Student Behavior Change Intentions. Jan Kavookjian, Auburn University. Objectives: Patient challenges for initiating and maintaining health behavior change are often poorly understood by health care providers engaged in disease management encounters. This study describes a personal health behavior change active learning activity (ALA) and its impact on students’ self-reported intentions to continue their target behavior. It is hoped that this experience with their own struggles and positive or negative intentions will inform their encounters with patients struggling with health behavior change. Method: First year pharmacy students (~150) in a health communication course selected a personal health behavior to target for change using a structured ALA. They responded to initial and four week follow-up questionnaires with behavior theory-based goal setting and weekly monitoring. Students reported self-efficacy, perceived importance of the change, perceived susceptibility to negative consequences, stage of change, and coping style. Associations among variables and intention to continue the change were analyzed using linear regression. Results: A significant model (F(5)=22.266, p<0.001) emerged. Model coefficients for self-efficacy (t=4.657, p<0.001), coping (t=-2.023, p=0.045), and importance (t=2.855, p=0.005) were shown to be significant contributors to self-reported intent to continue the target behavior. Perceived susceptibility (t=1.429, p=0.155) and stage of change (t=1.571, p=0.199) were not. Positive student comments about the ALA impact on understanding patients were provided. Implications: Understanding student health behavior motivations/intentions may inform design of teaching strategies that will help them understand their own behavior change struggles and those of the patients they encounter, particularly regarding self-efficacy, approach or avoidant coping, and awareness-raising about the benefits (importance) of making the change.

Impact of an Interdisciplinary Patient Case Simulation Activity on Student Pharmacists’ Readiness for Interprofessional Learning. Marwa Noureldin, Purdue University, Karen S. Yehle, Purdue University College of Health and Human Sciences, School of Nursing, Purdue University Center on Aging and the Life Course, Dinah C. Daldar, Purdue University College of Health and Human Sciences Department of Nutrition Science, Donna L. Zoss, Purdue University College of Health and Human Sciences Department of Nutrition Science, Kimberly S. Plake, Purdue University. Objectives: To evaluate the impact of an interdisciplinary patient case simulation activity on student pharmacists’ readiness for interprofessional learning. Method: Health professional students (pharmacy, nursing, and dietetics) participated in an interdisciplinary simulation activity where students worked collaboratively on two patient cases (diabetes and hospice), interviewed standardized patients, and developed action plans. Students completed pre-/post-questionnaires comprised of the Readiness for Interprofessional Learning Scale (RIPLS), a 19-item questionnaire with four subscales (Teamwork and Collaboration, Positive Professional Identity, Negative Professional Identity, and Roles and Responsibilities) utilizing a seven-point scale (1=strongly disagree to 7=strongly agree). Demographics included academic program, gender, and race/ethnicity. Data analysis included descriptive statistics and paired t tests of the student pharmacists’ cohort. Results: There was a statistically significant improvement in student pharmacists’ Teamwork and Collaboration subscale scores (57.9±5.1 to 59.7±6.5 out of a possible 63.0, p<0.01) and Positive Professional Identity subscale scores (24.4±3.6 to 25.8±3.3, out of a possible 28.0, p<0.01) following the simulation activity. After the activity, student pharmacists were more likely to agree that it is necessary for health care students to learn together (p=0.02) and that shared learning with other health professional students will increase their ability to understand clinical problems (p<0.01) and will help them think more positively about other professionals (p<0.01). Implications: Participation in an interdisciplinary patient case simulation activity improved student pharmacists’ readiness for interprofessional learning in the
areas of teamwork/collaboration and positive professional identity. Results highlight the value of interdisciplinary team-based activities in pharmacy education.

Implementation and Evaluation of an Advising Program’s Meet and Greet Session for Student Pharmacists. Lucio Volino, Rutgers, The State University of New Jersey; Danielle Candelario, Mary M. Bridgeman, Rutgers, The State University of New Jersey, Nancy Clinton, Rutgers, The State University of New Jersey. Objectives: To describe the implementation and impact of an Advising Program’s Meet and Greet Session on interactions between advisees and advisors. Method: The Advising Program’s goal is to pair students with faculty mentors capable of guiding them through the professional program with assistance reflective of the student’s interests, skills and goals. All students are strongly encouraged to meet with their advisor annually; this is an elective program. The committee has identified barriers to fostering student/adviser interaction. In Fall 2013, first professional year student advisees and advisors were invited to attend an introductory Meet and Greet program. Two separate online surveys evaluating perceptions of program participation and impact were distributed. Results: 58% of advisors attended the program; 61% of faculty and 41% of students completing the survey. Advisors and advisees found the program valuable (100%, 85%) and recommended holding it for future classes (100%, 93%), respectively. 88% of advisors agreed that the event improved their success in meeting with advisees. 71% believed less time and resources were spent scheduling/meeting with advisees. 61% of students felt more comfortable contacting advisors after participating, with 83% agreeing it was more convenient than scheduling individual meetings. Over half of students preferred more one-on-one time with their advisor and 25% expressed feeling uncomfortable contacting their advisor had their advisor not contacted them first. Implications: An advising Meet and Greet program can facilitate advisee/advisor interactions while reducing time and resources associated with scheduling one-on-one/group meetings. This activity could be implemented by other institutions seeking to improve advising relationships.

Importance of Consultant Pharmacy Services: Comparison between Pharmacy Student and Nursing Facility Member Rankings. Christopher J. Jadoch, D Youville College, David A. Gettman, D Youville College. Objectives: To compare the importance of services provided by consultant pharmacists ranked by third-year pharmacy students taking an elective in consultant pharmacy compared to nursing facility members. Method: This exploratory cross-sectional study used an instrument previously developed by Clark (2008) to rank the importance on a 5-point scale of 21 services provided by consultant pharmacists. The instrument had been administered to nursing facility members. The instrument was used an instrument previously developed by Clark (2008) to rank the importance on a 5-point scale of 21 services provided by consultant pharmacists. The instrument had been administered to nursing facility members. The instrument was used to cluster pharmacists and the nursing facility member rankings for extra services, the comparison is still meaningful for interprofessional education. Results can also serve as benchmark comparisons with results obtained by consultant pharmacists in their own facilities.

Innovative Model to study the Impact of Interprofessional Collaboration for Diabetes Patients in an Institutionalized Setting. Attequr M. Rahman, Rosalind Franklin University of Medicine and Science, Linda Mast, Neil Horsley, Diane Bridges. Objectives: This study addresses the critical need for innovation in public health workforce training and continuing education to foster effective interprofessional collaboration. The focus of this study was to assess the impact of interprofessional collaboration on practitioners who were charged with creating an interprofessional (IP) care model emphasizing primary and secondary prevention services specific for seniors with diabetes. Method: The impact of interprofessional collaboration as an intervention for practitioners was assessed using a half day problem-based learning workshop and facilitated group sessions over a six month time period. Practitioner subjects representing disciplines of Pharmacy, physicians assistant, physical therapy, nursing, registered dietitian, and podiatry all participated in the intervention. Using an authentic task-based curriculum and guidelines for required care protocols, these practitioner subjects completed a specific workshop about IP care collaboration and four facilitated work sessions. The impact of participating in an IP team was measured using pre- and post-test instruments including the Interprofessional Education Perception Scale (IEPS) to assess attitudes and the Concerns-Based Adoption Model (CBAM) to assess actual behaviors related to interprofessional collaboration. Results: Results of this research provided a workforce training and facilitated team building model that can be used to enhance interprofessional collaboration. The study demonstrates a process for implementing a continuing education program that engages an interprofessional healthcare team in the creation of an effective preventive care model. Implications: Initial findings are promising in that this innovative approach to continuing education resulted in both increased interprofessional collaboration behaviors and more favorable attitudes about working in inter professional environment.

Interprofessional Care: an Introductory Session on the Roles of Health Professionals. Melissa Durham, University of Southern California, Desiree Lie, Keck School of Medicine of USC, Anne Walsh, Keck School of Medicine of USC, Jan Trial, Keck School of Medicine of USC, Kevin Loheny, Keck School of Medicine of USC, Christopher Forest, Keck School of Medicine of USC, Kathleen H. Besinque, University of Southern California. Objectives: When health care providers work interprofessionally, clinical outcomes improve, and interprofessional education (IPE) is required in most health professional accreditation standards. To train our students to realize the importance/value of interprofessional teamwork, a case-based IPE session was designed to provide an opportunity to learn about one another’s roles in health care, practice team-building skills, and reflect upon the experience. Method: Using recommendations from the Interprofessional Education Collaborative (IPEC) and World Health Organization (WHO), a case-based IPE activity for year 1 medical (n = 182), year 2 and 3 pharmacy (n = 180) and year 3 physician assistant (PA, n = 106) students was piloted then implemented. Post-session quality assessment (using 5-point Likert scale survey questions) was obtained, with qualitative analysis of narrative responses by students and faculty to open-ended questions. Results: Ninety-two percent of medical students felt that they increased their knowledge about another profession, compared to 82% for pharmacy and PA. Medical and pharmacy students felt they learned the most about PAs (54% and
67%, respectively), while PA students learned the most about pharmacy (95%). Qualitative feedback brought into question the level of PA students learned the most about pharmacy (95%). Qualitative feedback brought into question the level of proficiency (professional roles). Session assessment and student reflection are considered to be vital components.

Knowledge Retention of Basic and Clinical Science Materials in a PharmD Program. Elizabeth J. Unni, Roseman University of Health Sciences, Rajan Radhakrishnan, Roseman University of Health Sciences, Erin L. Johanson, Roseman University of Health Sciences, Erik Jorvig, Roseman University of Health Sciences, Scott K. Stolte, Roseman University of Health Sciences. Objectives: To determine the retention of basic and clinical science materials in a PharmD program.

Method: A retrospective data analysis was conducted using assessment score data. The students were assessed on their basic science materials from P1 year at various time points – end of P1, P2, and P3 years. Similarly, they were assessed on their clinical science materials at two time points – end of their P2 and P3 years. Correlations and paired t-tests were used to estimate the retention of basic and clinical science course materials over the three year timeframe. Results: For basic science material, there was a significant, but low correlation between the end of P1 and end of P2 assessment scores (r = 0.354, p = 0.000). The paired t-test showed a significant difference between the two scores (81.70 vs. 79.60; p = 0.006). The correlation of basic science material scores between the P2 end of year assessment and P3 end of year assessment was not significant. For clinical sciences, there was a significant strong correlation between the end of P2 assessment score and end of P3 assessment score (r = 0.621, p = 0.000). Also, there was no significant difference between the two scores. Implications: Results show retention of clinical science material over a time period of one year, but not of basic science material. Results are similar to medical education literature. Given that this is the first study conducted in pharmacy education on knowledge retention, replication of the study as well as future research is needed.

Longitudinal evaluation of student perception of standardized patient simulation on patient counseling confidence during IPPE. Yu-Chieh Chen, Manchester University College of Pharmacy, Mary E. Kiersma, Manchester University College of Pharmacy. Objectives: The goal of this research is to longitudinally investigate student pharmacists’ overall perceptions about how standardized patient (SP) encounters influence students’ confidence in patient counseling during both community and institutional aspects of introductory pharmacy practice experiences (IPPEs). Method: A longitudinal survey was conducted via a self-administered questionnaire. The 35-item and 38-item, 5-point Likert scale surveys were tailored for community and institutional pharmacy skills respectively. The surveys were created to measure student pharmacists’ perceptions about (1) the general usefulness of SP simulation on their IPPE performance, and (2) the impact of SP simulation on their patient counseling confidence, focusing on the change of the confidence in counseling skills and techniques needed in different pharmacy settings. Descriptive statistics and paired t-test were performed using SPSS v.21.0. Results: Forty-nine student pharmacists completed the survey in both 2013 and 2014 (87.5% response rate). Overall, students perceived higher usefulness of SP simulation in 2014 (4.32 vs. 4.08), and considered SPs’ feedback in identifying counseling strengths and improvement areas more beneficial than previous year (4.08 vs. 3.88). While comparing patient counseling confidence on institution-focused skills and techniques before and after SP encounters, results indicated that students’ perceptions significantly improved in identifying patient and caregiver relationship, determining appropriateness of new prescriptions and making proper recommendations to current therapy plan (p-value < 0.001). Implications: This research provided evidence that SP simulation increases students’ patient counseling confidence in both community and institutional aspects of IPPEs. As clinical knowledge increases, students can be more confident in providing more advanced and complex patient counseling.

MMI as Predictor of Academic Achievement in the Doctor of Pharmacy Curriculum. Nazach Rodriguez-Snapp, University of South Florida, Jacqueline Grosser, University of South Florida, LaShonda Coulbertson, University of South Florida, Heather MW Petrelli, University of South Florida. Objectives: The objective of this study was to assess for the predictive validity of the MMI. Method: The study sample included 107 first-, 66 second, and 53 third-year students. Pearson product-moment correlations were used to identify relationships between pre-admission variables (e.g. PCAT percentile composite score), MMI scores, and demographic variables such as gender, age, and ethnicity, and multiple regression analysis was used to determine if the MMI scores predicted academic achievement measurements (e.g. as PY1 GPA, end of semester exams and end of year exams). Results: Analysis was performed on the third-year class and no significant correlation was found between MMI score and first year cumulative GPA, pharmaceutical skills I and II course grade, end of semester exams and end of year exams. Gender was significantly related to total MMI interview scores, which indicated that female students performed better at the interview format than male students. There is a significant negative correlation between undergraduate (cumulative) incoming GPA and MMI score, r(53) = -.287, p < .05. Similar analysis will occur with first- and second-year class data. Implications: The predictive validity of the MMI process remains to be determined. The MMI is best predictive of performance on observed structured clinical examinations (OSCE), which are intended in part to assess students’ non-cognitive skills. As such, future research is needed that will examine the relationship between MMI scores and students’ performance in OSCEs and in advance pharmacy practice experience rotations.

Measurement Characteristics of a Concept Classification Exam Using Multiple Case Examples: A Rasch Analysis. Marion K. Slack, The University of Arizona, Nicholas Jennings, University of Arizona, Lea E. Mollon, The University of Arizona, Terri L. Warholak, The University of Arizona. Objectives: To determine if an exam using multiple case examples to test research design concepts was unidimensional and had a hierarchical easy-to-difficult structure, and to determine if item difficulty varied according to the design used in the case example. Method: The exam consisted of 50 multiple choice items associated with five example abstracts: a randomized controlled trial, pretest-posttest, crossover, database, and descriptive designs. A Rasch analysis was conducted to determine dimensionality and structure. Items were stratified by design to explore the relationship between item difficulty and study design. Overall difficulty was assessed using an item-person map. Results: The exam was administered to 101 students; the mean was 88.4% (mean score = 44.2; SD = 3.5). The Rasch analysis indicated the exam was unidimensional with an easy-to-difficult structure. Overall, the exam was easy; there were no items that distinguished between the upper 52% of students. The stratified analysis indicated that overall no one research design was more...
difficult than other designs, however, the type of research design and item topic interacted so that an easy item for one design could be difficult when associated with a different study design. **Implications:** That the exam was easy and did not differentiate between higher scoring students indicates that the exam functioned more like a mastery exam than an exam for ranking students consistently from low to high ability. That item topic interacted with study design to affect item difficulty indicates that items on the same topic are needed to test basic design concepts across study designs.

**Metropolitan Area Health Literacy Needs and Pharmacy Services: Data Collection through IPPE.** Daniel L. Prohotsky, St. John Fisher College, Asim M. Abu-Baker, St. John Fisher College, Kelly Conn, Christian Volk, Faust Novello, Jill E. Lavigne, St. John Fisher College. **Objectives:** To test the feasibility of collecting community-wide data about pharmacy practices and neighborhood needs in health literacy through a required Introductory Pharmacy Practice Experience. **Method:** P2 students (N=78) matched to community pharmacies (N=78) in Fall, 2013 were assigned to collect data based on the Agency for Healthcare Research and Quality’s Pharmacy Health Literacy Toolkit (a tour, a staff survey and a student-administered patient survey). Patients were surveyed at the same time on the same date across all 78 sites. Respondents were the first at the counter at 15-minute intervals, 1 lam-lpm. An Advanced Pharmacy Practice Experience student audited student site tour data. Excel, SPSS and Google Maps were used to summarize findings. US Census data provided demographics. **Results:** By pharmacy zip code, poverty was 4.3 to 47.4% and high school graduates 98.1% to 67.2%. Pharmacy services for patients with low health literacy were excellent (mean scores > 2.8) for filling out forms, patient counseling, and print materials. Opportunities for improvement (mean scores <2.0) were identified for: (1) clarity of prescription labels, (2) patient education materials, and (3) community literacy resources. 71 patients completed surveys. 67 (93.06%) reported being treated with dignity. Yet, 14 (19.2%) reported that staff used words they did not understand. 37 (51.4%) said staff did not explain effects of non-adherence. **Implications:** Student participatory research using the AHRQ pharmacy toolkit can provide a community-wide map of community pharmacy practice and neighborhood needs.

**Participatory Quality Enhancement Plan (QEP) Surveys Yield High Student Response Rates.** Jonathan Cook, Appalachian College of Pharmacy, Sarah A. Justus, Appalachian College of Pharmacy, M. Nicholas Headley, Appalachian College of Pharmacy, Tina Fletcher, Appalachian College of Pharmacy, Jason McGlothlin, Appalachian College of Pharmacy, Ajay N. Singh, Appalachian College of Pharmacy, Rebecca M. Spivey, Appalachian College of Pharmacy, Tina Fletcher, Appalachian College of Pharmacy, Tonuya McGlothlin, Appalachian College of Pharmacy, Asim M. Abu-Baker, St. John Fisher College, Kelly Conn, Christian Volk, Faust Novello, Jill E. Lavigne, St. John Fisher College. **Objectives:** The Appalachian College of Pharmacy (ACP) recently embarked on a college-wide participatory dialogue to identify main areas for improvement as part of our Quality Enhancement Plan (QEP). This study investigated the students’ response rates to QEP surveys vis-à-vis the course evaluations. **Method:** QEP surveys were sent to all ACP students, alumni, faculty, staff, preceptors and Board members of ACP. The QEP process and survey was designed by a committee comprised of three students, two staff and four faculty members. Students on the committee informed their peers about the QEP process and survey through presentations and used their closed Facebook class groups to post reminders to complete the survey. The committee offered three of the required 150 community service hours to each student who completed the survey as an incentive. Survey results were made public. **Results:** Student response rates for the QEP survey were 90.00% (P1), 81.84% (P2) and 54.29% (P3) whereas the median student response rates for course evaluations were 86.49% (P1), 26.71% (P2) and 32.86% (P3). Reflecting the students’ interest, over half of the P1 and P2 class accessed the survey results online and they formed an online forum to discuss the QEP findings. **Implications:** The participatory QEP process and survey achieved student response rates higher than for typical course evaluations and galvanized strong interest and participation in the process from the students. Factors for the high response rate will be analyzed using a post-survey instrument and may be applied to future course evaluations.

**Perceived Abilities of Third Year Pharmacy Students in Performing Medication Therapy Management.** Ahmed M. Alshehri, The University of Texas at Austin; Jamie C. Barner, The University of Texas at Austin; Sharon Rush, The University of Texas at Austin. **Objectives:** The Accreditation Counsel for Pharmacy Education mandated colleges/schools of pharmacy (CSoPs) to teach students Medication Therapy Management (MTM) services provision to better prepare them for practice. Some CSoPs inititated MTM courses that provided students with MTM didactic courses while others use experiential education. The study objectives were to describe the ability level of third-year pharmacy students (P3s) in providing MTM, to identify areas for enhanced instruction, and to determine students’ intentions to provide MTM services in practice. **Method:** An anonymous 48-item survey using a 5-point Likert scale (1=strongly disagree; 5=strongly agree) was administered to P3s (N=54) prior to the start of their MTM course. Forty-six items measured abilities in MTM provision using the following 6 subdomains: medication therapy review, medication-related problems identification/recommendations, disease measurement/monitoring, communication, follow-up/referral, and billing/documented. Two items assessed intent to provide MTM in practice. Descriptive statistics and Cronbach’s alphas were used. **Results:** All enrolled P3s (N=54) completed the survey. Subdomain scale alpha coefficients ranged from 0.74-0.99. Regarding the 6 subdomains, P3s showed the highest confidence in performing disease measurement/monitoring (4.2±0.6) and lowest confidence in documentation/billing (2.1±1.0). Intent to provide MTM services was moderately high (3.8±0.9). The remaining subdomains’ confidence ranged from 3.3-3.9. **Implications:** Prior to the start of an MTM course, P3s were confident in measuring and monitoring blood pressure, glucose and cholesterol. However, students need more training in documenting and billing for services. CSoPs may want to assess student abilities at baseline so that the course can be directed towards strengthening skills.

**Perceptions of Pharmacy Students’ Stress and Stressors: A Comparative Analysis across Two Multi-campus Universities.** Clara Awe, University of Illinois at Chicago, Caroline A. Gaither, University of Minnesota, Stephanie Y. Crawford, University of Illinois at Chicago. **Objectives:** Colleges of Pharmacy at the University of Illinois at Chicago (UIC) and University of Minnesota (UM) have primary campuses in Chicago and Minneapolis and respective satellite campuses located 85 miles northwest (Rockford, IL) and 155 miles northeast (Duluth, MN). Objectives were to compare the perceived levels of stress and stressors among pharmacy students based on institution (UIC or UM) and campus types (main or satellite), as well as academic self-efficacy (which is theoretically inversely related to stress) and causes of stress. **Method:** A survey instrument using previously validated items was developed, pre-tested, and administered to first-, second-, and third year pharmacy students at UIC and UM in spring 2013. Data analyses included descriptive statistics, two-way ANOVA, and chi-square. **Results:** Responses were received from 822 students.
for a 76% response rate. Two-way ANOVA showed consistent differences between institutions in terms of perceived student stress levels, self-efficacy inventory, and total stress-related causes (p<0.01). While campus type did not show a main effect, a significant interaction effect was found between institution and campus type for perceived stress and student self-efficacy (p<0.01). Institutional and campus differences were found in awareness of campus counseling services (p<0.01), with few differences in stress coping methods of students.

Implications: Reasons for institutional differences in student stress levels may include instructional methods (e.g., reliance on distance technology), city livability, and psychological support services. Pharmacy schools should assess factors that cause students’ high levels of stress and provide effective intervention programs to help ensure student well-being.

Perceptions’ of a Student-Led Team Based Learning Course. Ana Hincapie, California Northstate University, Justin W. Bouw, California Northstate University, Vasudha Gupta, California Northstate University. Objectives: The purpose of this pilot study was to assess students’ perceptions of a student-led team-based learning (TBL) elective. Method: Doctor of Pharmacy candidates in their 3rd professional year were assigned two clinical topics relating to management of diabetes. For each topic, teams developed learning objectives, a 15-minute mini-lecture, and a TBL-application exercise and delivered to their student colleagues. A faculty member facilitated the discussion. Volunteer students completed a survey upon completion of the course and participated in a focus group discussion, moderated by a researcher independent from the elective coordination, to share their views on learning in a student-led TBL course. Results: Thirty students enrolled in the elective and completed the survey. Most respondents (n=23) agreed that creating their own TBL modules enhanced understanding of difficult concepts, improved their self-directed learning skills (n=26), and improved comprehension of TBL pedagogy as a result of this course. However, 60% disagreed with incorporating student-generated TBL module assignments into core curricular classes. Focus group data shed light on these results, as students identified the development of application exercises as the most challenging aspect of creating TBL modules. Additionally, participants agreed on the importance of a summary discussion led by faculty at the end of each TBL module to help facilitate student learning. Implications: Student-led TBL enhances self-directed learning skills in an elective course. However, further studies are needed to evaluate the benefits of integrating student-led TBL classes into the core curriculum.

Pharmacy on the Silver Screen: Portrayal Through the Ages. Eric C. Nemec, Western New England University, David M. Baker, Western New England University. Objectives: The intent of this research project was to catalog the portrayal of pharmacists in North American movies and to categorize characteristics of the roles as well as historical accuracy to draw sociological conclusions correlated to societal perspective of pharmacy practice. Method: The authors independently conducted a systematic review of known Internet movie databases (e.g., IMDB, TCM, AFII) for keywords such as pharmacy, pharmacist, drugstore, or druggist, which were considered indicative of pharmacist or pharmacy portrayals in feature films. Films were considered eligible if produced in North America, available to be viewed, and/or contained a credited or uncredited pharmacist role or pharmacy depiction. Results: We identified 207 movies released between 1900-2013 that contained a pharmacy scene. The majority (66.1%, n=137) of pharmacist roles in film occurred before 1960. When stratifying by type, most of the roles were cameo appearances, or in the background of the primary story. The genres that feature a pharmacist most frequently are comedy (42%) and drama (28.6%). While there are a number of featured roles from the past decade, none of them have the star power of film pharmacists pre-1960. Implications: Culture, in the modern age, is often documented through media. Our conclusion is that portrayals of the profession are a surrogate marker for the public’s perception of pharmacy’s place in society. The drugstore served different functions during the first half of the 20th century versus the latter half, which is clearly reflected in popular media. Movies mirror the evolution that occurred in pharmacy practice over the last century.

Pilot-testing of a Protocol to Determine Best Practices in Health Literacy Education. Aleeda M. Chen, Cedarville University, Anastasia L. Armbruster, St. Louis College of Pharmacy, Shin-Yu Lee, St. Louis College of Pharmacy, Margarita Echeverri, Xavier University of Louisiana. Objectives: To pilot-test a protocol for conducting an effectiveness review of literature to evaluate best practices in teaching methods, assessment, and interventions in health literacy education. Method: A protocol was developed by the AACP-SIG in Health Disparities and Cultural Competence (HDCC) to evaluate evidence of best practices in HDCC educational interventions for health-related professions. Following the protocol, a literature search in the area of health literacy was conducted using pre-defined terms. Team members independently reviewed the articles found to determine if studies met inclusion criteria (i.e., type of educational intervention, learning outcomes, type of study) and performed a critical appraisal of evidence (quality, utility, extent, strength, outcomes, setting), objectives and assessment quality, and results. Studies had to achieve a minimum number of points to be included as best practices. All team members also assessed the protocol and evaluation criteria to determine their usefulness in evaluating health literacy research, and to identify areas of needed clarity. Results: Of the 16 articles retrieved for the pilot test, 5 (3 pharmacy students, 2 medical students) met criteria for appraisal, and 4 articles were recommended as best practices. Reviewers suggested revising the protocol to better address evaluation of qualitative work. Implications: Based on these results, it appears the protocol, with minor revisions to include qualitative work, will be beneficial in performing an effectiveness review of literature on health literacy. As faculty continue to incorporate health literacy concepts into their curriculum to meet ACPE standards, information on the most effective methods to teach health literacy is essential.

Predictors of Scores on the North American Pharmacists Licensure Examination (NAPLEX) Differ by Competency Area. Lisa Lebovitz, University of Maryland, Fadia T. Shaya, University of Maryland, Viktor Chirikov, University of Maryland, Cherokee Layson-Wolf, University of Maryland, Jill A. Morgan, University of Maryland, JuliAna G. Brammer, University of Maryland, Shannon R. Tucker, University of Maryland. Objectives: The objective of this project was to explore the patterns and drivers for better scores on the NAPLEX’s three competency areas. Method: We collected data on 362 PharmD students who graduated from University of Maryland School of Pharmacy over 2011-13 and took the NAPLEX. Using ordinary least squares regression, we evaluated factors considered to be associated with higher scores on the three scaled areas: PCAT composite and subtest scores, undergraduate cumulative GPA, PharmD cumulative GPA, letter grade for the PharmD law class, type of pharmacy academic degree, age, gender, and geographic location at the time of application to pharmacy school. Results: Best fit multivariate regressions included final GPA and PharmD class law grade modeled separately. The selection of predictors with final GPA resulting in better fit and explained greater variation of the NAPLEX scaled areas.
Public Health Resources Related to the Clinical Prevention and Population Health Curriculum Framework and Pharmacy Curriculum. David A. Gettman, D’Youville College, Audrey Kostrzewa, Concordia University Wisconsin, Veronica S. Young, The University of Texas at Austin, Sheila Seed, MCPHS University - Worcester, Manchester, Shannon L. Reidt, University of Minnesota, Macary W. Marciniak, University of North Carolina at Chapel Hill, Abby A. Kahaleh, Roosevelt University, Hoai-An Truong, University of Maryland Eastern Shore. Objectives: In response to a previous study generated by the Public Health SIG Assessment Committee in 2010, which revealed which aspects of public health were being taught by faculty of USA pharmacy schools/colleges, the purpose of this study was to review current public health literature and develop a comprehensive list of references to aid pharmacy school/collarige in teaching all aspects of public health outlined in the Clinical Prevention and Population Health Curriculum Framework (2009). Method: This was a literature review conducted by members of the Public Health SIG Assessment Committee. A literature search was conducted using search engines PubMed, MEDLINE, Ovid, IPA, SCOPUS and Google Scholar from 2004 to 2014. In addition, information about other relevant resources, such as textbooks and public websites, was also obtained. All information was then compiled and summarized. Results: A total of 89 textbooks, 8 journals and 93 journal articles were extracted and analyzed. Extensive research in the literature suggests that some areas of the Clinical Prevention and Population Health Curriculum Framework have many resources, whereas other areas do not. Implications: Evidence suggests a need for more cases and audio-visual materials related to public health in general and pharmacy in particular. It is anticipated that the information from this review, including the comprehensive list of public health references, will be beneficial to pharmacy faculty attempting to integrate public health aspects into pharmacy curricula.

Quality of Life of Pharmacy Students. Elizabeth J. Unni, Roseman University of Health Sciences, Leean Madrid, VRx Pharmacy Services, Nathan Christensen, Roseman University of Health Sciences, Gary M. Oderda, The University of Utah, Surasak Saokaw, The University of Utah. Objectives: The objectives of this study were to measure overall quality of life (QoL) of pharmacy students in a national sample, to compare the QoL between different academic settings, and to determine the factors that contribute to the QoL of pharmacy students. Method: A cross sectional survey study design was utilized with six schools. Qualtrics® was used to collect data regarding QoL, personal demographics (e.g. age), and school demographics (e.g. class year). QoL was measured using Self-Rated Health, Wellness, and Quality of Life (SRH). SRH has five domains – physical, mental/emotional, stress, life enjoyment, and overall quality of life. Results: The reliability of the SRH scale was acceptable (α = 0.833 to 0.856 across the domains). Schools were selected through a stratified random process to assure representation of private, public, three and four year programs. A total of 922 students (33% response rate) responded to the survey. The 4-year private school students had a significantly higher overall QoL than the 4-year public school students. When compared across all types of schools, the emotional/mental domain had lowest scores and P2 students had lowest QoL. Factors that affected the various QoL domains are lower commute time, having children, being married, P4 class, experiential class, no prior bachelors degree, having a post-graduation plan, less frequent assignments/assessments, and being female. Implications: Further research is needed to better characterize the reasons for the improved QoL of 4-year private school students and to improve the QoL of second year pharmacy students.

Reengineering A Traditional Drug Literature Evaluation Course Using Transformative Redesign and Blended Learning Principles. Lawrence B. Staubach, University of Wyoming. Objectives: 1.) To understand how a drug literature evaluation (DLE) course delivered in a new blended learning (“flipped classroom”) format may have affected second year pharmacy students’ learning experience and engagement in the learning process. 2.) To evaluate a process for undertaking major course re-design and “flipping” of DLE courses in a way that maximizes the engagement and satisfaction of students and faculty leading to improved learning outcomes. Method: A needs analysis was conducted with a convenience sample of current fourth year pharmacy students and clinical faculty. Course redesign was accomplished through inter-disciplinary collaboration of clinical and social administrative faculty from related follow-on courses utilizing the approach of D. Fink and blended learning course development techniques. Qualitative analysis of secondary data (a “keep doing, start doing, and stop doing” written assignment and anonymous course evaluations) was performed. Results: Course organization, including the appropriate length, and quality of the online lectures and the quality, perceived relevance, and timeliness of active learning exercises, was the attribute cited most often by students as a driver of satisfaction. Students were split on whether a blended format with in-class active learning enhanced their engagement and satisfaction. Student and faculty participation in the needs assessment was pivotal to linking the course to the marketplace and practice. Implications: To realize the advantages from a blended learning environment, flawless course organization is a key prerequisite. For faculty considering such redesign initiatives, this study provides a blueprint for thoughtful, integrative transformation of traditionally delivered pharmacy courses.

Relationships between Values of Socially Responsible Leadership and Psychological Foundations of Morality among First-Year Pharmacy Students. David A. Gettman, D’Youville College. Objectives: The primary objective was to evaluate the relationships between the eight values of leadership and the five psychological foundations of morality. The secondary objective was to determine whether gender and or age made a difference in the strength of these relationships. Method: The eight values of leadership were assessed using items from an instrument developed by Tyree (1998). Using Likert scaling, the 68-item Socially Responsible Leadership Scale measures subject responses on the following: change, citizenship, collaboration, commitment, common purpose, congruence, consciousness of self, and controversy with civility. The foundations were assessed using the 32-item Moral Foundations Questionnaire developed by Graham, Haidt, and Nosek (2008). The foundations are: harm-care, fairness-reciprocity, in-group-loyalty, authority-respect, and purity-sanctity. Results: 71 out of 77 PharmD students (35 female, 36 male) ranging in age from 22 to 32 years taking a first year communications, diversity
Role of Location in Identifying Uninsured at Risk-patients During Student Pharmacist-run Health Screening Outreach Events. Jason Chadwick, Appalachian College of Pharmacy; Jonathan Cook, Appalachian College of Pharmacy; Ajay N. Singh, Appalachian College of Pharmacy; Sharon Deel, Appalachian College of Pharmacy; J. Adam Farmer, Appalachian College of Pharmacy; Paul Gavaaza, Loma Linda University; Ingo H. Engels, Appalachian College of Pharmacy. Objectives: The Appalachian College of Pharmacy (ACP) runs a community clinic that offers free prescription and medical therapy management services to the poor and uninsured in our rural, medically underserved community. The clinic has been minimally visited by local residents. To improve its utilization, student pharmacists embarked to determine a location optimal for the identification of uninsured and medically at-risk-patients at community health screening events. Method: Student pharmacist-run health screening sites were set up in parallel targeting patrons at two locations, a local upscale Food City and discount Save-A-Lot grocery store. Students approached patrons and offered them a menu of screening services including blood pressure, blood glucose, full lipid panel, and body mass index check. We assessed the number of patrons that were screened and that were uninsured and/or medically at risk at each location. Those who were identified to be medically at risk were referred to either their primary health care provider or to our free prescription program if eligible. Results: Forty-four patrons were screened at Save-A-Lot and 41 were screened at Food City. More at risk-patients were identified at Save-A-Lot (43%, n = 19) than at Food City (36%, n = 15). About 26% (n = 5) of the risk-patients at Save-A-Lot were referred to the free prescription program due to a lack of health insurance while none at the Food City store were eligible. Implications: Student pharmacist-run health screenings at Save-A-Lot are more effective in identifying the economically and medically in need-population of our community.

Social Media Policies at Colleges and Schools of Pharmacy. Victoria P. Kleszczynski, Western New England University; Alana S. Regan, Western New England University; Daniel R. Kennedy, Western New England University; Joshua J. Spooner, Western New England University. Objectives: As pharmacy students are increasingly connected to social media sites such as Facebook and Twitter, pharmacy programs have begun to implement social media policies (SMPs) regarding their appropriate professional use. In this study, we explore the prevalence of these policies and compile information as to what they include. Method: A 29 question online survey was developed and distributed to Assistant/Associate Deans of Student Affairs (or equivalent) at 117 colleges and schools of pharmacy nationwide. Results: The response rate was 34.1% (40/117). Among respondents, 29 schools (72.5%) have a SMP. Of these, 14/29 follow the SMP of the parent institution (University/College). The remaining 15 have a pharmacy school specific policy; all schools cited additional needs/expectations (HIPAA, experiential rotations, etc.) as the rationale for doing so. No school regularly reviews student social media profiles, but all will review social media issues brought to their attention. Facebook is the leading source of social media issues at 67.6% of schools. SMP violations are most frequently (65%) adjudicated by the student conduct/ethics board (or equivalent), with violation consequences ranging from reprimand to expulsion. Five of the 11 programs lacking a SMP plan to implement one within 24 months. Implications: The recent explosion in the use of social media sites by pharmacy students has created a complex interaction between professional appearance and social life. To try and help define these boundaries, a clear majority of programs have - or are developing - a SMP. These results can provide administrators guidance in structuring SMPs at their program.

Student Feedback Regarding Didactic Content and Practical Experience of Pharmacy-Led Influenza Vaccination Clinic Operations. David L. George, The University of Oklahoma; Katherine O’Neal, The University of Oklahoma; Eric J. Johnson, The University of Oklahoma; Michael J. Smith, The University of Oklahoma. Objectives: To collect student feedback on didactic content and practical experiences of influenza vaccination clinic operations. Method: Cross-sectional, survey design via Qualtrics. Pharmacy students who worked in the College-sponsored flu vaccination clinics during the 2012 and 2013 fall semesters were invited, via email, to rate their perceptions regarding instructional content and practical experience related to eight business operations of the clinics. Responses were compared between students enrolled versus not enrolled in the College’s Pharmacy Business and Entrepreneurship elective course. Results: A total of 110 students received the survey and 83 responded (75.5 percent). Perceptions of business elective and non-elective students only differed in whether they would like a practical experience of developing a physician protocol (36.7 vs. 61.8 percent, p = 0.045). Regardless of elective enrollment status, students agreed that receiving instructional content prior to clinic participation, having a corresponding practical experience, and reviewing instructional content after the clinic would be beneficial for learning most business operations. Clinic operations in which the largest proportions of students agreed they would like to have included didactic content on collection of billing information (62.5 percent), and a practical experience in managing clinic staff (78.5 percent). Implications: Students overall agreed that they would like to have both didactic and practical learning opportunities related to the business operations of a pharmacy-led vaccination course. Course coordinators will utilize this feedback to modify didactic content and related practical experience within the College’s Business and Entrepreneurship elective to optimize student learning.

Student Peer Assessment Rubric Performance over 16 years: Correlation with Faculty Evaluations and Grades. Thomas Hazlet, University of Washington; Jonathan H. Watanabe. Objectives: To determine the performance of a student intra-group peer assessment rubric and to compare to faculty course project evaluations, and final course grade. Method: Presentations and documents from a laws and ethics project were evaluated by faculty, and students evaluated themselves and their group peers using a “student intra-group performance evaluation” (GPE) rubric. Course data from 1998 through 2013 were evaluated. Counts of low performers (≤ yearly mean – 2 standard deviations) were determined for each year. Mean faculty grades (PROJECT), mean GPE and individual student course grades (numerical equivalent score, NES), were evaluated. Generalized Linear Model (GLM) Regression was used to determine associations between PROJECT, GPE, and NES, adjusted for year. Results: Per-class low performer counts varied from 2-8 (class
was used to identify differences in student pharmacists’ perception of leadership attributes and differences in their self-perception as future leaders based on demographic variables. **Results:** Cronbach’s alpha value of 0.931 indicated high reliability of the new instrument. ANOVA results were statistically significant only with regard to gender (p = 0.033). Female student pharmacists rated the leadership attributes higher than male student pharmacists. The remaining demographic variables did not show statistically significant effect. **Implications:** The study results are useful in mentoring and development of leadership curricula for students enrolled in a Pharm.D. program.

### Student Pharmacists’ Personal Finance Perceptions, Projected Student Loan Indebtedness, and Career Decision Making

Nicholas Hagemeier, East Tennessee State University; L. Brian Cross, East Tennessee State University; Chad K. Gentry, Lipscomb University; Gerry E. Miller, East Tennessee State University; Chelsea E. Phillips, East Tennessee State University; Daniel L. Rose, East Tennessee State University. **Objectives:** 1) Describe relationships between student pharmacists’ personal finance perceptions and projected post-graduation indebtedness; 2) Examine the association between personal finance perceptions, demographic characteristics, and post-PharmD career intentions. **Method:** Student cohorts at two colleges of pharmacy (N = 226) completed a self-administered 39-item questionnaire assessing personal finance perceptions, behaviors, student loan indebtedness, and post-PharmD career intentions. Parametric and nonparametric independent t-test and one-way ANOVA equivalents, and logistic regression techniques were used to examine differences across and relationships between study variables. **Results:** A 73% usable response rate was obtained. On average, students anticipate $169,323 (± $81,641) in post-graduation student loan debt and expect to pay off debt in 8.0 (± 6.4) years. Over 75% of students feel pressured to get out of debt upon graduation and 55% have a plan for debt repayment. Projected student loan debt did not differ across students who anticipate pursuing postgraduate training versus those planning to enter practice directly. However, students intending to directly enter practice were 2.6 times as likely to indicate debt influences their post-PharmD career plans compared to individuals intending to pursue postgraduate training (p = 0.001). Students intending to practice in community pharmacy settings were 3.3 times as likely to indicate debt influences their post-PharmD career plans compared to individuals planning to enter all other practice settings (p < 0.001). **Implications:** Our study adds to recent literature exploring the relationship between student indebtedness and career decision-making. Further research is warranted to explore interventions that foster increased personal finance self-awareness in student pharmacists and minimize student indebtedness.

### Student Pharmacists’ Perception of Leadership Attributes

Dale E. English, Northeast Ohio Medical University; Margarita Kokinova, Northeast Ohio Medical University. **Objectives:** A review of pertinent literature identified a deficiency of studies on the development of leadership attributes in students enrolled in Pharm.D. programs. The current study presents the development and validation of an instrument for assessment of student pharmacists’ self-perception as future leaders in the context of the attributes of the “ideal” leader. The study examines factors that may account for differences in student pharmacists’ perception of leadership attributes and provides evidence-based information to instructors, faculty, and mentors of future pharmacists in leadership positions. **Method:** A 40-item questionnaire with response options on a 5-point Likert scale was developed based on thorough review of existing instruments for measuring leadership attributes. Demographic questions included age, gender, prior degrees earned, membership and leadership in pharmacy and non-pharmacy organizations. After a pilot with 20 student pharmacists, the instrument was administered to 140 first and second professional year student pharmacists in March 2013. Cronbach’s alpha procedure was employed to test the reliability of the instrument. Factorial ANOVA
Students made changes in diet, and 8.8% made other health-related changes. Those who made changes related to exercise indicated a higher success rate post behavior than those who made changes in diet (p = 0.001). Students’ overall wellbeing was high (4.84 ± 0.88) prior to the intervention. Career wellbeing was the highest (5.05 ± 0.64), and physical wellbeing was the lowest (3.54 ± 0.95) before the behavior change. Physical wellbeing was the only statistically significant increase (3.54 ± 0.95 to 3.69 ± 0.83) that occurred after the behavior change (p = 0.043). Implications: A required behavior change activity allowed students to improve upon their health, as well as their physical well-being. Using this approach cannot only help students understand patient behavior change, but also can impact their personal health.

Student and Preceptor Perceptions of a Vaccination Education Service Learning Activity. Kimberly B. Garza, Auburn University, Matthew Savoie, Megan Zeek, Auburn University, Benjamin S. Teter, Auburn University, Margaret A. Williamson, Auburn University, Lynn Stevenson, Auburn University, Salisa C. Westrick, Auburn University. Objectives: To assess student and preceptor perceptions of a student-led IPPE patient education activity in community pharmacies. Method: A total of 136 immunization-certified pharmacy students and 51 preceptors participated in a structured IPPE patient education program in community pharmacies in May - August 2013. Each student a) assessed patients’ immunization status, b) informed patients about the severity of herpes zoster and vaccine effectiveness, c) made immunization recommendations, d) assessed patients’ acceptance/declination decisions, and e) administered the vaccine if requested. Preceptor perceptions of the program were measured using an online survey and student perceptions were captured through reflections. Results: A total of 18 preceptors and 98 students completed the online survey and reflection, respectively. Among preceptors, thirteen (72%) indicated that the activity was “extremely” or “very” useful in caring for patients, 16 (89%) indicated that the activity was “extremely” or “very” useful in education of students, and 17 (94%) indicated that they were “very” or “extremely” supportive of requiring a similar activity as part of future IPPE rotations. Only one (6%) indicated that the activity was “somewhat” burdensome, with 14 (78%) indicating “not at all.” Student reflections about the activity were generally positive. The most common themes that emerged were recognizing the need for patient education and patient appreciation/interest in the program. Other common themes included students’ positive practice experiences and benefit to patients and the community. Implications: This vaccination education activity was positively viewed by both preceptors and students and should be continued as part of student experiential learning.

Student Pharmacists’ Perceived and Actual Strengths as Measured by Strengthsfinder 2.0. Katie M. Anderson, Purdue University, Steven A. Scott, Purdue University, Kimberly S. Plake, Purdue University. Objectives: Reflective practice is a skill necessary for the professional development of student pharmacists, and includes the identification of strengths. The objective of this study is to assess first year professional year student pharmacists’ perspectives of Strengthsfinder 2.0 assessment and corresponding strengths-based activities. Method: Students (N = 151) participated in a professional development laboratory focused on the identification of individual strengths and their application to student development. Strengthsfinder 2.0, a validated online assessment tool, was utilized to identify students’ strengths. Students completed individual and group activities related to how strengths influence interaction with others, team dynamics, and approach to problem solving. At the conclusion of the lab, students assessed the laboratory and their learning using an 11-item survey. Results: Ninety-eight percent of students completed the laboratory assessment. Ninety-seven percent of students found the Strengthsfinder 2.0 online assessment moderately or very useful. The majority of students (95%) also found the group activities as moderately or very useful and 91% of students found the individual activity moderately or very useful. Eighty-seventy percent of students’ indicated that they achieved the learning objectives of the laboratory. Implications: The Strengthsfinder 2.0 tool can be utilized as a form of self-reflection for the professional development of student pharmacists. A majority of the student pharmacists found the utilization of Strengthsfinder 2.0, as well as the corresponding lab activities, as very useful. Future directions include incorporating strengths-based activities throughout the didactic curriculum.

Students’ Understanding of Research Methods Topics: A Rasch Analysis. Jill M. Augustine, The University of Arizona, Marion K. Slack, The University of Arizona, Terri L. Warholak, The University of Arizona. Objectives: The objective was to examine student pharmacist change from pre- to post-test on concept-based multiple-choice questions in the area of research design. Method: Second-year student pharmacists were given a pre-test exam on the first day and an identical post-test exam on the last day of a Research Methods course. The pre-post-test, was structured such that students were presented with an abstract from the peer-reviewed literature followed by twenty-five concept-based multiple-choice questions. Rasch analysis was used to determine differences between: 1) student pre- and post-test score; 2) question difficulty; and 3) construct shift. Results: Ninety-four students completed the pre-post tests. The mean raw pre-test score was 45.6 (SD 19.9), when converted to logit scale is a mean of 12.1 (SD 2.6), and the mean raw post-test score was 63.8, when converted to logit scale is a mean of 17.0 (SD 2.7). Students showed significant
improvement in scores from pre- to post-test (p-value<0.001). Additionally, construct shift was detected for a few questions. One question on sampling became relatively easier (p<0.05), and two questions, on selecting the most appropriate statistical test and result interpretation, became relatively more difficult (p<0.05) on the post-test. The most difficult question on the pre-test was identifying the type of variable. The most difficult question on the post-test was involving selecting the most appropriate statistical test. **Implications:** Overall, results indicated that students learned about research methods. Students still have problems selecting the most appropriate statistical test. In future courses, additional instruction may be necessary for these difficult topics.

**Study Designs and Outcome Measures Used to Evaluate the Impact of Teaching and Learning Strategies.** Spencer E. Harpe, Midwestern University/Downers Grove, Elizabeth A. Davidson, Midwestern University/Downers Grove. **Objectives:** To describe the study designs and outcome measures used to evaluate the impact of teaching and learning strategies. **Method:** Articles evaluating teaching and learning strategies were identified by reviewing peer-reviewed papers published in 2012 from 14 pharmacy journals (2 education-focused and 14 practice-focused). Letters to the editor and articles with no evaluation aspect were excluded. Multiple study designs were possible within each article because individual objectives may have used different designs. **Results:** Overall, 110 articles were identified as evaluating teaching and learning strategies. Only 6 (5.5%) articles included true experimental designs. Most (94 [85.5%]) used a quasi-experimental approach. Only 2 (1.8%) were completely observational in nature, and 8 (7.3%) employed a qualitative approach. The most common designs were the one-group pretest-posttest design (55.5%) and the one-group posttest-only design (26.4%). Comparison groups were used in 12.7% of articles, and 12.7% of the articles used multiple posttests. For study outcomes, 103 (93.6%) used internal measures of learning (e.g., perceptions or attitudes), 66 (60.0%) used external measures (e.g., knowledge or performance), and 59 (53.6%) used both internal and external measures. Of the articles involving internal measures of learning, only 18 (17.5%) mentioned reliability/validity information for any internal measure being used. **Implications:** Weak study designs and measurement approaches reduce the ability to make valid conclusions about the effects of teaching and learning strategies. Faculty members must recognize the importance of strong study designs and reliable and valid measurement approaches when evaluating teaching and learning strategies and designing associated evaluation tools.

**Survey of Lesbian, Gay, Bisexual and Transgender (LGBT) Inclusion: Campus Climate in Colleges/Schools of Pharmacy.** Anita Jackson, The University of Rhode Island, Kelly L. Matson, The University of Rhode Island, Jennifer L. Mathews, St. John Fisher College, Amy L. Parkhill, St. John Fisher College. **Objectives:** To quantify the implementation of best practices for improving the campus climate for LGBT individuals in pharmacy schools nationwide. **Method:** An anonymous, electronic survey was sent to administrators at 130 pharmacy schools. The survey was modified with permission from a 2010 Campus Pride survey of higher education and was designed to identify inclusive practices for and institutional commitment to LGBT faculty/staff, student and administrator life. **Results:** Forty-four survey responses were received (33.8% response rate) with all National Association of Boards of Pharmacy (NABP) districts represented. In relation to institutional policies and commitment, 30.8% of schools have public written statements that include both sexual orientation and gender identity, 21.1% utilize LGBT inclusive materials (e.g., applications, promotional materials, health forms), and 69.2% allow faculty and student designation of a preferred name. In relation to campus climate, 23% of respondents stated their school of pharmacy had participated in a LGBT training program and 51.4% had a LGBT student and ally organization on campus. No pharmacy school reported specific scholarships for LGBT students or allies, and 64.9% of respondents said they had no events to promote LGBT awareness at their school. Only 13.5% of schools offered LGBT students a process to be matched with a LGBT-friendly roommate and 8.1% offered gender-neutral/single occupancy restrooms. More than half of schools have a bias incident or hate crime reporting system as well as counseling services for LGBT concerns. **Implications:** Pharmacy schools are lacking in uniform implementation of best practices to improve campus climate for LGBT students, faculty, staff, and administrators.

**Teaching Global Health Ethics Using Simulation.** Tina Brock, University of California, San Francisco, Phuoc Le, University of California, San Francisco, Marwa Shoeb, University of California, San Francisco School of Medicine, Tea Logar, University of California, San Francisco, James Harrison, University of California, San Francisco, Stacy James-Ryan, University of California, San Francisco School of Nursing, Marcia Glass, University of California, San Francisco School of Medicine. **Objectives:** To address the unique ethical challenges of working in resource-limited international settings, we designed and piloted a simulation-based program for students, residents and fellows in dentistry, medicine, nursing, and pharmacy. The objectives of the project were to expose the trainees to specific ethical dilemmas and to have them reflect on appropriate courses of action. **Method:** Following an extensive literature review, we conducted 3 focus groups (n = 16 participants) of UCSF faculty with global health experience. This led to the creation of 8 simulation scenarios; 4 of which were selected for the pilot. We trained standardized patients (actors) to portray the roles and we redecorated our simulation center to resemble a village. Trainees who were scheduled to complete an international rotation during the academic year (n = 27) from the Schools of Dentistry, Medicine, Nursing, and Pharmacy rotated through the four scenarios which were videotaped for thematic analysis. Participants completed the pre- and post-simulation surveys and a follow-up focus group was conducted. **Results:** Program evaluations assessed the impact of the training on participants’ exposure to common ethical issues in global health, the ability to strategize and deal with these ethical dilemmas, and the ability to identify someone to turn to for guidance. The results showed significant increases in all areas. **Implications:** Preliminary results show that our global health ethics simulation accomplished its main objectives. Next steps include evaluating impact of the tool once trainees return from their international rotations.

**The Prevalence of Writing Instruction in Doctor of Pharmacy Programs.** Meaghan H. Paris, Western New England University, Nika Bejou, Western New England University, Daniel R. Kennedy, Western New England University, Joshua J. Spooner, Western New England University. **Objectives:** A common complaint among faculty members is that pharmacy students lack sufficient writing skills. This study was conducted to determine the degree to which Doctor of Pharmacy (PharmD) programs in the United States formally incorporate writing training courses into their curricula. **Method:** An online survey tool was developed and distributed to the Dean of Academic Affairs (or equivalent) at 123 US PharmD programs. **Results:** A total of 47 responses were obtained (38.2%). Amongst respondents, 30 (63.8%) indicated that writing instruction was part of their PharmD curriculum.
Of these, only 3 (10.0%) utilize a stand-alone required writing instruction course within their curricula, while 2 (6.3%) offer elective or remedial courses in writing. The other 25 programs (83.3%) incorporate writing skill instruction longitudinally throughout their curricula, though most programs designate only 10 clock hours or less of writing instruction. Despite the fact that 17 programs exclude writing instruction within their curriculum, 75% indicated that written communication skills are included within their program’s mission, vision, values, and/or expected outcomes. Further, only 1 (5.9%) of these programs has plans to integrate writing instruction into the curriculum within the next 3 years. Implications: Despite the shared concern that pharmacy students lack adequate writing skills, less than 10% of US PharmD programs offer stand-alone writing courses, with a majority of programs allocating less than 10 clock hours of writing instruction. Future curricular modifications that increase writing instruction may foster written communication skill enhancement in pharmacy students.

The Impact of an Interactive E-learning Tool in a Flipped Seizure Module of Neurologic Pharmacotherapy. Jacqueline McLaughlin, University of North Carolina at Chapel Hill, Denise H. Rhoney, University of North Carolina at Chapel Hill. Objectives: Pharmacotherapy 446 is a required course for second year students in the UNC Eshelman School of Pharmacy Doctor of Pharmacy program. In 2013, the seizure module of the course was redesigned so that foundational content was provided to students prior to class and face-to-face class time was dedicated to active learning exercises. The purpose of this study was to examine student performance, engagement, and perception of an interactive online preparatory tool designed to foster learning. Method: This study was IRB approved and informed consent was obtained. Participants were randomized to the interactive online tool (n = 57) or the conventional handout (n = 59) for class preparation. Preparatory content and dedicated class time were identical for both groups. Academic performance measures, online engagement indicators, and course evaluation data were collected. Results: Students using the online tool scored significantly higher on the final exam (p = 0.04). The number of distinct days used to access the online tool exhibited moderate positive relationships with the quiz (r = 0.35) and exam (r = 0.38). The time of first access exhibited a strong positive relationship with exam performance (r = 0.48). The majority of students assigned to use the online tool agreed that learning was enhanced by the online tool (74.1%) and in-class case-based activities (71.1%). Implications: Interactive online preparatory tools can enhance student learning of seizure material. Students value learning foundational content prior to class and engaging in case-based discussions during class time.

Using Evidence Base to Effectively Develop Pharmacy Faculty. Yashwant V. Pathak, University of South Florida, Kevin B. Sneed, University of South Florida, Mohamad Kasti, The Physician Leadership Institute TM Center for Transformation and Innovation (CTI), R Edelbi, The Physician Leadership Institute TM Center for Transformation and Innovation (CTI). Objectives: Faculty development programs are designed as didactic lectures in academic topics and have mixed outcomes. This might be in part due to the way faculty perceives their abilities and how they identify their needs for development and lack of evidence to identify critical needs of the faculty Method: As part of the Pharmacy Leadership Academy at the USF COP, we used evidence to assess strengths and development needs using a 360 degree assessment tool (online) for confidentiality and feedback that allowed faculty perform a self-assessment to rate their abilities in teaching, research, innovation, professional and interpersonal skills. The tool was provided to all 16 faculties, (managers and peers) who were part of the two year faculty development program Results: The 69% faculty rated themselves higher than their, interpersonal competencies (22% gap between manager and self-assessment) 20% gap in research and innovation, The faculty were rated 5% higher by other stakeholders (Peers) The over 95% faculty perceived their abilities as strengths with limited areas of development as evident in the baseline pre assessment Variations were identified based on faculty back ground, experiences and gender. After 2 years there was improvement in skills and behaviors as validated by a T Test. Self-rating improved over 1 year after development by across competency domains was 5% with research and innovation by 9% since the academy focus on this area. Implications: This poster will share how evidence base is used to identify the gaps between faculty self-evaluations and other feedback and its implications on faculty development.

Using a Proven Industry Strategic Planning Process in a School of Pharmacy (SOP). Lawrence B. Staubach, University of Wyoming, Kem P. Krueger, University of Wyoming. Objectives: To evaluate how participation in a new planning process: 1.) Affected participants’ understanding of strategic planning and 2.) Impacted SOP direction and faculty engagement. Method: A cross-sectional survey design was used to evaluate a new process kicked off by a 2-day meeting to develop the school-level plan using an industry-proven strategic planning process. A series of meetings followed where each standing SOP committee developed their own strategic plan, nested within the SOP’s plan. In addition, each committee developed an Action Plan to identify tasks to be completed this year- identifying the person responsible, due date, and required resources. Pharmacy faculty were invited by email to participate in the online survey. Results: This process provided key information on the advantages and importance of a planning process that: requires metrics at all levels of Objectives, Strategies, and Tactics; clearly inter-links Objectives and Strategies throughout the organization (top to bottom); and transparently drives planning into action and achievements. Respondents reported 1.) understanding the: key elements of strategic planning (88%) and role of the process in providing future direction (88%) and 2.) feeling: a sense of ownership of the process (75%), more connection to each other (75%), more hope and excitement about the future of the SOP (86%), and enhanced commitment to implementing the new vision and mission (86%). Implications: Thoughtful strategic planning followed by flawless execution by engaged, vested participants will contribute to better prepared PharmD graduates, innovative research, and pharmaceutical care that enhances the health of the communities we serve.

Voices of Pharmacy Past Project: Student-Conducted Oral Histories to Preserve and Archive Past Pharmacy Practices. David M. Baker, Western New England University, Uyen Nguyen, Western New England University, Nina Losito, Western New England University, Maja Hodzic, Western New England University. Objectives: The project’s objective was to preserve oral histories and historical materials of pharmacists who graduated before 1970 and/or from the former Hampden College of Pharmacy. The intent was to collect and archive historical data regarding past pharmacy education and practices for present and future historical research. Method: In preparation, students were trained on the operation of video-recording equipment and methods of conversational interview. Students and faculty developed sample questions covering ten subject areas to be used during the interviews. A typical video-recorded interview was conducted in a conversational manner over a two-hour period during which the interviewer-student adjusted the questions to fit the interviewee’s background. Simultaneously, items brought in by the pharmacist was photographed or scanned. Subsequently, interviews were
preserved electronically in three different ways, with a DVD copy being sent to the interviewee. The College’s copies were indexed by subject matter and stored in different physical locations. Results: Thirteen interviews with ten pharmacists and considerable historical material was recorded and archived. The students improved their communication skills, and expanded their understanding and appreciation of past pharmacy practice and education. The pharmacists enjoyed the interaction with students, the preservation of their past reminiscences, and connections made with the school. The electronic archives are and will be an irreplaceable repository of historical data that is and will be mined by present and future historians. Implications: This project is demonstrative of the learning that can occur by all participants (students, faculty, pharmacists and historians) in the production and/or use of video-recorded, electronically-archived oral histories.

Where’s the Minority Representation? State of Affairs in Academic Pharmacy. Angela M. Hagan, Belmont University, Hope Campbell, Belmont University, Daniel C. Lane, Wingate University, Caroline A. Gaither, University of Minnesota. Objectives: While under-represented minorities (Black, Hispanic and American Indian/Alaska Natives) comprise over 30% of the current United States population; they continue to be under-represented in academic pharmacy. Currently, less than 5% of faculty composition includes under-represented minorities. Under-represented minorities account for only 5-10% of the students earning PharmD, PhD, and MS degrees. This is significant as it signifies the pipeline from which future faculty are produced. In a rapidly changing cultural landscape, under-represented minorities also represent individuals whose perspectives are increasingly important to health care delivery in the United States. To investigate the impact of changing population trends on the representation in academic pharmacy over the past decade, particularly as it relates to faculty and students in other medical professions and faculty in general. Method: Data were obtained from the AACP Institutional database, the Survey of Pharmacy Faculty, AACP Profile of Pharmacy Students, AAMC Profile of Medical School Faculty and Medical School graduates and the US Census Bureau. Data were analyzed in SPSS and using trend analysis. Results: Within the past decade there has been a decrease in Black and Hispanic faculty representation, with gains in Asian and Foreign-born categories. Likewise, over 70% of PhD degrees are awarded to Asians and Foreign born students. There are similar trends in medical school graduates and faculty representation. Implications: As the number of under-represented minorities rise in the population, it is imperative that AACP member schools employ methods of increasing under-represented minorities not only in the student population, but also in faculty representation.

Who Leads Assessment?: Exploring Participation, Patterns and Potential in US Colleges/Schools of Pharmacy. Jeanine K. Mount, Northeastern University, Suntaree Watcharadamonrungkun, Chulalongkorn University. Objectives: In US Colleges/Schools of Pharmacy: 1. Describe and analyze patterns of involvement of stakeholder groups (senior administrators, faculty, staff, students, alumni) in assessment activities, to better understand assessment leadership 2. Explore the extent and balance of team activity in assessment-related efforts Method: A cross-sectional online survey was conducted between 10/2011-1/2012 in 121 then-accredited U.S. C/SOPs. Key informants from 92 C/SOPs (76%) completed the survey. Respondents were Deans or individuals they identified as knowledgeable about assessment and/or accreditation activities (e.g., Associate/Assistant Deans, Assessment or IT Directors, Assessment Committee chairs). Respondents identified specific persons involved in assessment and/or accreditation-related activities in the C/SOP, their roles and background. Results: Overall, 60% (72/121) of C/SOPs provided information regarding individuals who were part of their assessment efforts. The number of persons identified varied widely (range: 1-15; mean = 4.7; mode = 3). In 14% of C/SOPs, a single person was identified as responsible for assessment and in 57%, the first (key) person identified as involved in assessment did not hold an assessment-focused position. Of all persons identified, 32% were senior (dean-titled) administrators, 21% were administrative staff and 47% were faculty, students or alumni. Because 40% of C/SOPs included no faculty/students/staff and 36% included no staff, less than half of C/SOPs involved at least one each from senior administrator, staff and faculty/student/alumni groups. Greater presence of senior administrators was associated with greater faculty/student/alumni involvement in assessment activities. Implications: Who is involved in assessment reflects and shapes a C/SOP’s assessment culture. Senior leaders must recognize this as they work to advance assessment efforts.

Workload Perceptions of West Virginia Pharmacists: Part of Changing a National Trend. Fadi M. Alkhateeb, Texas A&M Health Science Center, Omar F. Attarabeen, West Virginia University, David A. Latif, University of Charleston. Objectives: To identify and compare pharmacists’ perceptions of workload in West Virginia (WV) with the 2009 National Pharmacist Workforce Survey (NPWS) Method: A mail survey was sent to all licensed pharmacists in WV (a total of 1970 pharmacists). Survey items were adopted from the 2009 NPWS. These items measured perceptions of current workload, workload change over the past year, and workload impact on personnel satisfaction and quality of providing pharmaceutical services Results: A total of 596 responses were received, yielding an adjusted response rate of 30%. The majority of WV pharmacists believed that the current workload assigned to pharmacists is high or excessively high. This perception follows the trend of the 2009 national manpower study that reported an increase of 14% (between 2004 and 2009) of pharmacists who indicated that their workload was high or excessively high. Similar to the 2009 national manpower study, about 61% believed that pharmacists’ workload has increased or greatly increased over the past year. Implications: Pharmacists of WV perceive their workloads to negatively impact the time they spend with patients, the quality of care provided to patients, and their ability to resolve and prevent drug-related problems. This negative patient care impact perception is more pronounced in our sample of WV pharmacists than in the 2009 NPWS study. Although there does not appear to be a severe shortage of pharmacists in WV presently, pharmacists report that they are currently required to complete more tasks related to patient care with the same amount of staffing levels.

Worse Academic Performance is Associated with Academic Entitlement. Meghan Jeffres, Roseman University of Health Sciences, Sean Barclay, Roseman University of Health Sciences, Scott K. Stolte, Roseman University of Health Sciences. Objectives: The objective of this study is to measure academic entitlement (AE) in four classes of pharmacy students in multiple phases of the curriculum and assess the relationship between AE and academic performance. Method: Students at a private health sciences university enrolled in a three year pharmacy program were emailed an electronic survey that included demographic data, academic performance, and two validated AE instruments. The survey was completed by the class of 2016 (P1), 2015 (P2), and 2014 (P3) in July 2013 prior to the start of the 2013-2014 academic year. The class of 2013 completed the survey in May 2013, two weeks prior to graduation. Students were identified as academically entitled if they scored greater than the median points possible in
either AE instrument. **Results:** The survey was emailed to 813 students and completed by 595, representing a 73.2% response rate. The frequency of AE for instrument A and B is 1.0% and 4.0% for P1s, 7.1% and 8.8% for P2s, 9.2% and 12.6% for P3s, and 10.0% and 10.0% for the graduates. Academically entitled P2 students required more reassessments (p<0.05). Academically entitled P3 and graduating students required twice as many reassessments than non-academically entitled students (12.0 vs. 5.2, p<0.05 and 12.3 and 5.4, p<0.05 reassessments) respectively. **Implications:** This study cannot identify a causal relationship between academic performance and academic entitlement, however based on the lack of AE in the incoming P1 students, it appears poor academic performance may be one factor leading to AE.

**Theoretical Models:**

**Pharmacy Student Satisfaction with Orientation Week “Service Day.”** Doug A. Meyer, Pacific University Oregon, Susan M. Stein, Pacific University Oregon, Brad S. Fujisaki, Pacific University Oregon. **Objectives:** A “Service Day” (SD) was started during Orientation Week in 2012 for P1 and P2 students with two goals: enhance team building and foster a culture of giving back to the community. In this three-year pharmacy program, teamwork is strongly emphasized and early bonding within and between classes is essential. **Method:** The school partnered with local nonprofit organizations to identify 14-16 service opportunities, ranging from 2-7 hours in length. Limited slots per activity required students to sign up electronically on a “first-come, first-served basis”. Participation was required. Faculty were invited and 9-10 participated. In total, 700 hours of service were provided in 2012 and 670 hours in 2013. Students completed an electronic feed-

**School Poster Abstracts**

**A History of Mission and Innovation in Community Engagement.** Ann M. Ryan Haddad, Creighton University, Naser Z. Alsharif, Creighton University, Kimberly J. Begley, Creighton University, Laura Klug, Creighton University, Emily Knezevich, Creighton University, Linda K. Ohri, Creighton University, Kathleen A. Packard, Creighton University, Kate Martens-Stricklett, Creighton University. The mission of Creighton University commits faculty and students to engage with many vulnerable communities. The School of Pharmacy and Health Professions (SPAH) established the Office of Interprofessional Scholarship, Service and Education (OISSE) which provides infrastructure in a supportive role to health-related service learning and community engagement by faculty and students. Over 55 community partnerships have been initiated and maintained locally, regionally, and internationally. Service activities address prevention, early identification and/or treatment of various disease states through screenings, education and promotion, vaccine administration, and consultations. Populations are engaged across the life span, including the homeless, refugees, minority and other vulnerable groups. From July 1, 2012 to June 30, 2013, our partnerships resulted in a variety of local service learning events. Examples include Project Homeless Connect,
Shoo the Flu, Script Your Future, Interprofessional Fall Risk Assessment, Health Literacy, Financial Success Program, and free clinics. Thirty-one pharmacy faculty and 368 students provided 3,222 hours of service. Many events were interprofessional, involving nursing, medicine, occupational and physical therapy, and dental students. Sixteen pharmacy faculty and 181 students provided 1,129 hours of interprofessional service. Annual service learning in Chinhle, Arizona involved 6 students providing 96 hours of health-related service. The annual Dominican Republic summer clinics involved 11 students and 3 faculty providing 1,598 service hours. Impact on the community and student learning is assessed through partner and student surveys and various data reports. Outcome data on client impact and student learning will be presented. Scholarship related to these activities will also be described.

A Pharmacy Student-Facilitated Diabetes Clinic in a Native American Community. Sarah Levin Martin, Husson University; Curtis Cyr, Husson University; Carolyn Jacques, Xin Y. Deng, Abbey McCarthy, Community Dietitian, Margo A. Downing, Community Health Nurse, Benjamin W. Huerth, Medical Director, Paul D. Flagg, Pharmacy Director, Daniel J. Robinson, Husson University. Introduction: It is well established that Native Americans are at increased risk for diabetes when compared with non-Hispanic whites. Lifestyle interventions are effective in treating diabetes and an interprofessional model approach has proved important in diabetes management. Objectives: (1) Establish an interprofessional diabetes clinic facilitated by pharmacy students within the Penobscot Nation; and (2) monitor the preliminary impact of the clinic on the local diabetic population. Methods: A survey was developed to assess clinic satisfaction, number of clients attended, and medication prescribed. For the primary outcome of HgA1c, mean and median values were calculated at baseline (Spring 2013), which were used to establish two groups: controlled (HgbA1c <7%) and uncontrolled (HgbA1c >7%); and again at follow-up (Fall 2013). Change in HgbA1c was calculated and compared using Wilcoxon signed-rank test (SPSS, version 21). Results: Patients rated their overall clinic experience as 78% Excellent and 22% Good. Eighty-eight % of the patients agreed (an additional 9% somewhat agreed) that meeting with the pharmacy students was helpful. Among the uncontrolled group (n = 18), average HgbA1c values dropped from 9.3 to 7.6% (p = 0.004). Among the controlled patients (n = 30), 83% remained in the “controlled” category (average HgbA1c increased slightly from 6.2 to 6.4%). Implications: The pharmacy practice site established within the Penobscot Nation Health Center is a win-win situation; there is now a protocol in place for diabetes care, and the pharmacy students have a site for experiential learning that includes direct care.

A Portfolio of Innovative Community Activities from Northeastern University School of Pharmacy (NUSOP). Kathleen Bungay, Northeastern University, Carla Bouwmeester, Northeastern University, Michael Conley, Northeastern University, Danielle M. Gingras, Northeastern University, Michelle Jacobs, Northeastern University, Thomas M. Matta, Northeastern University, Debra J. Reid, Northeastern University, Jenny A. Van Amburgh, Northeastern University. Community health centers (CHCs) were designed to provide health and social services in poor and medically underserved communities. The needs persist, including ensuring safe and appropriate medication therapy. Objective: To describe the structure, process and outcomes of innovative, community-rooted activities initiated and maintained by NUSOP faculty for underserved populations. Methods: The NUSOP supports CHCs with 12 pharmacists who practice and teach in 7 locations. To fulfill community needs and departmental initiatives, we formed the NUSOP Society of Ambulatory Care (The Society). Results: Society members share their time and expertise through face-to-face and virtual meetings. By communicating practice strategies, experimenting with new teaching styles and exploring group research opportunities, The Society aims to be more prolific and efficient than any member alone. One example of the Society’s collaborative work is a series of community health fairs conducted over a 2-week span, including ~ 30 students and 15 faculty, supported by a grant from NACDS. In total, 214 people were screened for CV disease risk factors and students gained an awareness of their impact in the community. Other programs include a Healthy Days Initiative (community educational program), Farmers Market Initiative (assistance in locating proper nutrition), Brown Bag Seminar Series in senior housing, a Walking Group, New Americans (immigrants & refugees) Center medication education, participation in HRSA, PSPC initiatives, and sponsorship of 3 ambulatory care residencies. Conclusion: The Society initiatives serve as a method of working collaboratively to affect change in multiple communities and to instill the importance of community engagement in students.

Adding Health to Service Learning: The Evolution of Community Partnership in Public Health. Lynn R. Patton, Midwestern University/Glendale, Mitchell R. Emerson, Midwestern University/Glendale. For the sixth consecutive year, Midwestern University has been recognized on the President’s Higher Education Community Service Honor Roll. The College of Pharmacy Glendale (CPG) is a major contributor to this achievement. First-year CPG students have participated in service learning since 2005. This has evolved to focus on health-related activities in the course Community Partnership in Public Health that includes 24 hours of service with a public or private agency. In the past two years, 300 students have participated in health education, access, surveys, and/or local advocacy with agencies including county health clinics, a federally qualified health center, the local Area Health Education Center, and Women, Infants, and Children. The students interact primarily with individuals with low health literacy and limited English proficiency, and with other professionals including nurses, social workers, or dietitians. One activity is providing brief presentations on wellness and self-care topics such as Cold vs. the Flu, Poison Prevention, and OTCs for Children at clinics. Other activities have included: developing a pharmacy technician study guide for refugees who were health professionals in their country of origin, creating and delivering a program on marijuana to selected middle school students to provide to their classmates, working on health advocacy issues with the Asian-Pacific Community in Action, and developing and conducting surveys and focus groups on satisfaction by patients in clinics for the underserved. This has benefitted the public while the students have gained confidence in communicating health information with persons unlike themselves.

University of Wisconsin-Madison School of Pharmacy partnered to design and launch Wisconsin’s first stand-alone charitable pharmacy in 2013. The pharmacy’s mission is to improve the health of uninsured patients with limited income by increasing access to medications and healthcare services. Pharmacy start-up costs were obtained from donations, including a lead gift from the Oscar Rennebohm Foundation. The pharmacy operates on a modest budget, relying on multiple inventories consisting of free program, reduced-price, and purchased medications for prescription dispensing. Beyond employing a pharmacy manager, workforce needs are met exclusively by volunteers, most of whom are student pharmacists. This provides students with a valuable opportunity to serve a diverse patient population while addressing health disparities. Multiple collaborations advance this community-academic partnership, including (1) a student-formed, University-sanctioned student organization to support the SVdP charitable pharmacy, (2) the provision of disease state-focused screenings at the pharmacy by additional student organizations, (3) a scholarship program created by SVdP administrators to recognize two student pharmacists who devote their summers to providing patient care at the pharmacy, (4) student pharmacists providing direct patient care at the site during both Introductory and Advanced Pharmacy Practice Experiences, and (5) School of Pharmacy faculty and staff providing support and engagement, including volunteer training/coordination and on-site medication therapy management services. Faculty-led tobacco cessation services and diabetes education classes for patients are planned for the pharmacy in 2014.

An Interdisciplinary Approach to Developing a Culture of Community Engagement in the School of Pharmacy. Kimberly A. Ference, Wilkes University, Jennifer Malinowski, Wilkes University, Marie Roke-Thomas, Wilkes University, Mary F. McManus, Wilkes University. The Nesbitt School of Pharmacy has been committed to community engagement since its inception in 1994. Over the past 20 years, programs have been developed to encourage civic engagement as well as the health and wellbeing of local communities. Both curricular and co-curricular activities have been designed to promote a lifelong commitment to overall community development and service to those who are most vulnerable. Embedded within these activities are ongoing relationships and support of interdisciplinary teams. This includes both interprofessional health teams as well as the broader disciplines associated with the liberal arts, sciences, education and business. Some of the approaches include but are not limited to; self-directed IPPE, service learning, longitudinal care, coordination of free clinic services within northeastern Pennsylvania, focused community interprofessional opportunities, artistic productions, support of local community services, fund raising for community interests, alternative spring break productions, Affordable Care Act implementation, volunteer hours competitions amongst many other examples. Utilizing team-based, interprofessional and interdisciplinary approaches we instill a culture of responsibility to the community as well as interdependence among the stake holders. We will include our current and proposed methods of assessment (e.g., reflective journals, community impact, student attitude) and the future directions to sustain and promote community engagement as a valued characteristic of our students and pharmacists.

An Interprofessional World Medical Relief Student Organization: The Wayne State Experience. Helen D. Berlie, Wayne State University. Purpose: A student pharmacy organization was developed to collaborate with a medical relief student organization at the medical school. It provides interprofessional education (IPE) opportunities for pharmacy and medical students, internationally and locally. The purpose is to report student learning activities and perceptions of pharmacy integration during the first medical relief trips (Haiti and Nicaragua) as a joint organization. Methods: An anonymous and voluntary post-trip survey was administered to pharmacy and medical students. Surveys included Likert scale (five point) and open-ended questions with an emphasis on pre-trip preparation, in-country patient care, experiences with pharmacy/medical students, satisfaction of pharmacy services, and importance of interprofessional care. Results: Nine pharmacy students, 1 pharmacist, 33 medical students and 4 physicians participated in the trips. Pharmacy students assisted in triage, made recommendations, and participated in dispensing and patient counseling. Most medical students (93%) agreed the trip enhanced their understanding of a pharmacist’s role. Medical students reported satisfaction with overall pharmacy services (100%), pre-trip medication packing (78%), clinic medication organization (93%), therapeutic (85%) and dosing (85%) recommendations provided by the pharmacy team. Medical students agreed that the pharmacy team positively impacted overall clinic flow (100%) and that it was important to have a pharmacy team on their trip (100%) and on future trips (100%). All students agreed interprofessional care is needed to maximize patient care. Conclusion: Expansion of a medical relief student organization to include pharmacy has provided unique IPE opportunities. Ongoing program evaluation will lead to continued improvements in the interprofessional student organization.

Application for the Carnegie Foundation for the Advancement of Teaching Community Engagement Classification for 2015. Keith DelMonte, St. John Fisher College, Amy L. Parkhill, St. John Fisher College, Jennifer L. Mathews, St. John Fisher College, Christine R. Birnie, St. John Fisher College, Kathryn Connor, St. John Fisher College, Elizabeth Phillips, St. John Fisher College, Scott A. Swigart, St. John Fisher College. Objectives/intent: Community Engagement describes the collaboration between institutions of higher education and their larger communities for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity. Our school is an integral part of our college’s application for this recognition. Benefits of the Carnegie designation include Institutional self-assessment and self-study, legitimacy, catalyst for change, and institutional identity. Methods/process: Task forces were set up representing all schools within the college. The SOP had two representatives, one each from each department. Data was collected via email, online surveys, and interviews. The information was stored in the Compliance Assist program. The specific areas that were evaluated included: reciprocal community partnerships; community engagement rewarded in faculty promotion and tenure; systematic campus-wide tracking, documentation, and assessment of CE; and student engagement tied to the curriculum. Results/outcomes: Community engagement activities in the SOP include: service learning courses and rotations, mission trips, professional organization involvement, faculty interactions at their practice sites, outreach on campus to secondary schools and organizations, experiential education and didactic class opportunities. Implications: This application for 2015 provides recognition of outstanding community engagement to our college as a whole. In addition, the process has allowed the SOP to internally evaluate our community involvement and create a plan for the future.

Assessment of Community Engaged Service Learning in South Texas. Anna H. Brozick, Texas A&M Health Science Center, Maria Benavides, Texas A&M Rangel College of Pharmacy, Fadi M. Alkhtateeb, Texas A&M Health Science Center, John D. Bowman, Texas A&M Health Science Center, Veronica Nieto, Texas A&M Health Science Center.
Be The Match® at University of Kentucky Recruits Potential Bone Marrow Donors in Lexington Community. Christopher Terry, University of Kentucky, Laura Cannon, University of Kentucky, Sonali Patel, University of Kentucky, Lesley Williams, University of Kentucky, Frank Romanelli, University of Kentucky, Emily S. Brouwer, University of Kentucky. Background: Every four minutes, someone is diagnosed with a blood cancer. Many of these patients will die without a bone marrow transplant from a matched donor and rely on the Be The Match® Registry to help them find one. Be The Match® is a non-profit organization under the National Marrow Donor Program and relies on recruitment for the registry via events coordinated by volunteers. Joining is effortless and can be completed with a simple cheek swab and registration kit. This kit is returned to Be The Match® at no cost to the donor. Project: The University of Kentucky (UK) College of Pharmacy hosted a student-led donor drive in Spring 2012 and has since expanded the project to encompass the entire city of Lexington. Subcommittees comprised of student volunteers were developed to maximize fundraising, outreach, and relationships with campus organizations, leading to a substantial community impact. Results: The donor drive in April 2012 was the second-largest student-run drive ever. From 2012 to present, UK Be The Match® has added 990 potential donors to the registry, while raising over $23,000. UK Be The Match® has been the most successful student-run organization in the history of the program, cumulatively adding the most donors over the two year period. Conclusions: Seventy percent of patients who need bone marrow transplants do not have a familial match and need the assistance of bone marrow registries. Through donor drives held in Lexington, local communities are provided both opportunities for awareness and the chance to be someone’s match.

Building Community Collaborations: A Focus on an Innovative Senior Medication Safety Program in South Carolina. Brianne L. Dunn, South Carolina College of Pharmacy, Jill E. Michels, South Carolina College of Pharmacy, Christina A. DeRienzo, South Carolina College of Pharmacy, P. Brandon Bookstaver, South Carolina College of Pharmacy, Kelly R. Ragucci, South Carolina College of Pharmacy. The Palmetto Poison Center and the South Carolina College of Pharmacy partnered with senior centers, low income housing communities and faith based organizations throughout South Carolina to accomplish a shared vision and fulfill a community need to educate seniors on medication safety. This state-wide innovative initiative utilized second year pharmacy students and focused on raising awareness and empowering seniors in improving medication knowledge. Students were grouped based on geography and provided with resources necessary to implement and deliver the medication safety program. A one-hour orientation session was required for all students and included information on poison center services, an overview of the presentation and distribution of resources. Program materials included a flip chart of medication safety information, a supplemental script to enhance and guide the presentation as well as medication checklists for participants to enhance medication adherence. Written anonymous evaluation forms for both students and participants were utilized for program assessment. In 2012, 179 students reached over 600 seniors in 17 of 46 counties in the state at 62 sites. Eighty-seven percent of the students believed the seniors learned new ways to remain safe while taking medication and 78% agreed the program increased their ability to communicate with non-healthcare individuals. Additionally, 90% agreed the experience motivated them to continue community outreach as a healthcare professional. This partnership between a regional poison center, college of pharmacy and community senior groups increases medication safety awareness and enhances learning opportunities for senior adults and students.
Celebrating Community Engagement with a “Day of Service” Event. Joseph K. Bonnarenes, Manchester University College of Pharmacy, Ahmed Abdelmageed, Manchester University College of Pharmacy, Yu-Chieh Chen, Manchester University College of Pharmacy, Ozlem H. Ersin, Manchester University College of Pharmacy, Andrea L. Murray, Manchester University College of Pharmacy, Jennifer N. Riggle, Thomas R. Smith, Manchester University College of Pharmacy, Michael E. DeBishop, Manchester University College of Pharmacy. Objective: Design and implement a day-long event to celebrate, recognize, and reflect on our college’s commitment to community engagement and service. Methods: Our program established a service progression requirement to promote a service learning philosophy and assist students in engaging with our community. Students are required to engage in two community service events each semester and reflect upon their experiences. Once per semester, our program holds a Day of Service, designed to celebrate the service provided by our students and faculty. Each Day consists of poster sessions featuring a student’s experience with a service event and other service related presentations. During the academic year, each student presents one poster on one Day and serves as an evaluator the other Day. Results: In the first two years of our service learning progression requirement, our students have accumulated over 2,500 service hours with over 45 different service organizations. Nearly 150 individual and group posters have been presented at our Days of Service. Additional presenters have included community leaders from local service organizations, service leaders from Manchester University, and faculty and students from the College of Pharmacy. Conclusions: Our Day of Service highlights and celebrates our institution’s commitment to service to the community and provides students with the opportunity for inspiration and reflection on the value of service to oneself and others.

Classrooms in the Community: Shenandoah’s Opportunities for Community Engagement. Amber R. Wesner, Shenandoah University, Marcia L. Brackbill, Shenandoah University. Shenandoah University highly values using the community, and world, as an extension of the classroom. Our Center for Public Service and Scholarship was established with the purpose of creating citizen leaders and active members of the community in our students by engaging in public service. Faculty and students interact with the community by participating in activities and fundraisers such as Relay for Life and Habitat for Humanity. However, two opportunities that are unique to Shenandoah’s pharmacy program include: “Medicare Part D Day” and the “Compassionate Pharmacy.” “Medicare Part D Day” allows faculty and students the opportunity to directly engage with patients in order to assist them in understanding Medicare Part D insurance plans, consult on their medication regimens, and facilitate enrollment in an appropriate and cost-effective plan. On average, 75 patients are seen each year by approximately 50 student pharmacists and faculty; resulting in one-on-one sessions and dedicated time for the community member to engage and benefit from our student’s knowledge and expertise. The “Compassionate Pharmacy” is a nonprofit organization supported and staffed by our School of Pharmacy. In this facility, patients are enrolled into manufacturer’s pharmaceutical assistance programs, with the guidance of a patient advocate, in order to obtain medicines they otherwise could not afford. Following acquisition of the medications, volunteer pharmacists and students process and dispense these prescriptions and provide patient counseling to the patient. These services are provided at no cost and help to make our community members healthier by helping patients obtain the medications they need.

Collaboration between Pharmacy Students and an NCI-designated Comprehensive Cancer Center to Address Cancer Health Disparities. Ruth Vinall, California Northstate University, Moon Chen, Julie Dang, University of California Davis Comprehensive Cancer Center, Xiaodong Feng, California Northstate University, Cyndi Porter, California Northstate University, Dai Nguyen, California Northstate University, James A. Palmieri, California Northstate University, David Pearson, California Northstate University. Pharmacy students and faculty at California Northstate University College of Pharmacy (CNUCOP) have partnered with cancer health disparities experts at University of California, Davis Comprehensive Cancer Center (UCDCCC) to provide outreach to Asian Americans in their local community. Cancer health disparities exist in this population for many reasons including lower screening rates and lack of access to culturally and linguistically appropriate healthcare services. Pharmacy students, who are members of CNU’s Cancer Awareness, Research, and Education Society (CNU-CARES), CNUCOP faculty, and UCDCCC healthcare professionals work together to address cancer health disparities in several ways: collaborating at health fairs to screen Asian Americans for hepatitis B and C (both risk factors for liver cancer); providing cancer health disparities education to pharmacy students, faculty, and preceptors at yearly symposia; publishing cancer awareness articles in Vietnamese and English in local magazines; and counseling Asian American cancer patients on the benefits of enrolling in UCDCCC clinical trials and donating biospecimens. Pharmacy students are well placed to address cancer health disparities because as nascent drug experts, they are able to effectively counsel patients, and are themselves often from minority populations. While the outcomes of this innovative collaboration have not yet been formally assessed, it already has resulted in deeper interaction between CNUCOP and UCDCCC. For example, CNUCOP and UCDCCC are developing a memorandum of understanding that will allow for sharing of resources and expertise, constructing a federal grant submission, and co-teaching between curricula at the two institutions.

Collaboration of MCPHS University-Boston with Student and Community Organizations to Promote Safe Medication Use in Seniors. Amee Mistry, MCPHS University - Boston, Dhiren K. Patel, MCPHS University - Boston, Catherine Taglieri, MCPHS University - Boston, Michael G. Carvalho, MCPHS University - Boston. The faculty and students of MCPHS University-Boston through the involvement of FASCO (Faculty and Student Community Outreach), APhA-ASP (American Pharmaceutical Association-Academy of Student Pharmacists) and the Student Public Health Association, obtained a grant through the Boston Public Health Commission to partner with the Mission Hill Health Movement to provide medication education sessions to seniors in the inner city. The goal of the community outreach program was to educate seniors on their medications and the importance of disposing outdated and unused/unwanted drugs. Three senior living facilities were visited during the spring 2014 Semester within walking distance of the University. At each event, three faculty and four student government representatives as well as four APPE students interacted with a total of 75 residents providing a power point presentation and handouts on safe medication use. As part of the drug take-back portion of the event, pre-paid bags were distributed to collect expired and unwanted medications to mail to a drug destruction facility. As a result of the positive response to these events, they will be repeated throughout the year. This will serve to further consolidate the collaboration between students and faculty of MCPHS University-Boston, neighborhood action groups and the senior community in an inner city setting.

Community Engagement to Prepare Youth for Health Promotion and Advocacy. Shirlette G. Milton, Texas Southern University, Jason Monroe, Texas Southern University. Objective: To expose youth to
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Concepts of healthcare disparities, bioethics and the role of health professionals in achieving health equity through a common reading experience of the book “The Immortal Life of Henrietta Lacks”; and prepare them for future roles in health promotion. This pilot project tests the hypothesis that the use of a common reading experience can accomplish this objective. This project promotes an initiative of adolescent health in Healthy People 2020. Methods: Teens, 13-18 years old, participated in an introductory session and were assigned to read the book. Students participated in a group readiness assessment, prior to the book discussion and an individual survey following all activities. Responses to the readiness assessment were measured by recording group scores and item analysis for each question. Responses to the individual survey were categorized as positive, negative or no impact. Results: Results indicated that 58% of teens read the book and group scores for the readiness assessment ranged from 20%-70% (mean value 48% +/-21). Teens (79%) indicated they would change their behavior regarding health practices and 74% indicated they would discuss health information gained with peers and/or family members as a result of this activity. Implications: Teens gained knowledge regarding health disparities, bioethics and the role of health professionals and identified opportunities for health promotion. Community engagement to prepare youth for roles in promoting healthier communities can be accomplished through a common reading experience of the referenced book. Future studies will include college level students and promoting interprofessional education.

Community Engagement. A way of life at the University of Minnesota, College of Pharmacy, Pamala A. Jacobson, University of Minnesota, Timothy P. Stratton, University of Minnesota, Todd D. Sorensen, University of Minnesota, Tom A. Larson, University of Minnesota, Julie K. Johnson, University of Minnesota, Shannon L. Reidt, University of Minnesota, Karen MS Bastianelli, University of Minnesota, Marilyn K. Speedie, University of Minnesota. Community engagement has deep roots at the University of Minnesota, College of Pharmacy, touching our missions of service, education and research. Our students, faculty and staff are engaged with under-served rural and urban communities, health disparities, local and national healthcare industries, leadership, advocacy and preparing pharmacists to engage in civic responsibilities. In our Teaching Mission we address community needs as part of the EPPE course sequence. Faculty assist community health systems develop residency education sites. In our Research Mission faculty engage the American Indian community through the Research for Indigenous Community Health (RICH) Center in Duluth, finding ways to improve the health of by improving communication between providers and patients to address chronic pain and curb prescription drug misuse. We work with Hmong community leaders to find ways to improve the response of Hmong people to drug therapy through understanding differences in genetics. Our Service Mission is wide reaching and we provide inter-professional healthcare to medically underserved patients at the Philips Neighborhood Clinic in St. Paul and the HOPE clinic in Duluth. A unique community-based residency program promotes development of community-based practice sites and teaches leadership skills. The College-led MTM network for the University healthcare plan improves health among university employees and families. We campaign for policy changes that expand the ability of pharmacists to serve the public. It is the College of Pharmacy’s culture of engagement across many community partners makes us unique. Community engagement is central to who and what we are.

Community Engagement: A Core Value of Northeast Ohio Medical University, Dale E. English, Northeast Ohio Medical University, Harmony N. Ramunno, Northeast Ohio Medical University, Susan P. Bruce, Northeast Ohio Medical University, Charles T. Taylor, Northeast Ohio Medical University. Community engagement is a foundational component of the educational experience at Northeast Ohio Medical University’s (NEOMED) college of pharmacy. Our values are reflected in the “Six Cs” of our educational, research and work environment: Competence, Communication, Caring, Curiosity, Character and Community. Our student pharmacists, faculty, and staff diligently strive to continually provide multiple levels of community engagement, such as disease and medication therapy management activities, medication adherence outreach, participation in community health and wellness fairs, volunteerism at local underserved clinics, medication misuse and abuse prevention sessions in local school districts, as well as pipeline programs. Our campus is located in a small rural community, which is less than 40 minutes from the metropolitan areas of Cleveland, Akron, Youngstown, and Canton. This provides a uniquely diverse regional population of rural, suburban, and urban cultures. Our student pharmacists and faculty have an incredible opportunity to promote social change in the public’s perception of pharmacists and the services they are capable of providing to all patients through these community outreach efforts as well as embracing the melting pot of diversity in northeast Ohio. From a national perspective, our university has been recognized as a member of The President’s Higher Education Community Service Honor Roll, as recently as 2010 & 2013 for the work of our university’s students in an estimated 2400 and 5500 community service hours, respectively. This poster provides a snapshot of the numerous outreach initiatives and interprofessional activities engaged in by our students, faculty, and staff.

Community Engagement: Outreach, Experience, Scholarship and Advocacy. Anandi V. Law, Western University of Health Sciences, Doreen Pon, Western University of Health Sciences, David Q. Pham, Karl M. Hess, Western University of Health Sciences, Eric K. Gupta, Western University of Health Sciences, Micah Hata, Western University of Health Sciences, James D. Scott, Western University of Health Sciences, Daniel C. Robinson, Western University of Health Sciences. Western University of Health Sciences (WesternU) College of Pharmacy aligns its community engagement efforts within its mission: “Educating future pharmacy professionals to serve the health care needs of society and improve the quality of patient care through science, caring and humanism.” Community engagement activities are varied in scope to fit the local community – health fairs, screenings, etc. However, WesternU’s innovative approach is in integrating a community-based focus in the classroom, in experiential education and in faculty driven scholarship. Each community engagement activity is initiated by a faculty member interested in a certain aspect; for example: oncology faculty engaging volunteer/APPE student pharmacists (experience) in educating high school students on skin cancer prevention (outreach); then analyzing and presenting the data (scholarship). Additional examples in various geographic settings include: working within a local FQHC, participating in interprofessional health fairs (local or campus-based); diabetes education liaison activities (regional); and medication disposal services and education (statewide advocacy) – all being aligned to experiential outcomes and faculty scholarship. This approach benefits students who receive experience in a variety of community activities and settings, as well as the required professionalism credit. These efforts benefit faculty in expanding their clinical expertise, networks, recognition through invitations for professional presentations; as well as in scholarship outcomes. Finally, it aligns with the College’s and University’s community service mission; and provides increased visibility and credibility in the local community. The central framework for these community engagement activities and data from a few efforts will be presented, to demonstrate an innovative approach.
Community Health Screening Events: Innovative Interprofessional Experience and Community Engagement. Glenda Carr, Idaho State University, Lindsey M. Hunt, Kristin Moore, Rick Tivis. The Community Health Screening (CHS) program located within Idaho State University- Meridian Health Science Center (ISU-MHSC) has two major goals: to directly connect participants identified as having major health concerns to local primary care providers and to offer an interprofessional experiential activity for students. Over the past four years, approximately 700 community members have received glucose and cholesterol, HIV and hepatitis C, nutritional, hearing, vision, blood pressure, depression and alcohol, and brief oral screening tests; incorporated into various sequential stations. In addition, the CHS provides free influenza vaccines when available. These services are applied through an interprofessional approach utilizing faculty and students from ten healthcare disciplines within ISU-MHSC; each station operating with at least 2 health care professional students. Through community engagement, a list of referral sources with medical, mental and dental health was created and given to participants at the end of the screening as a way to educate them about health care resources in the area. Early efforts indicated that providing names of healthcare facilities was an insufficient means of connecting CHS participants to primary care; therefore, community partners were asked to allocate expedited appointments at their respective clinics. Since October 2012, more than 100 pre-scheduled medical, dental, and mental health appointments have been provided to screening participants. This change has made a difference with some clinics reporting show rates of people who expect to have a minimum of 25 patient encounters, conduct a community outreach project, and participate in the class public health project. Students, preceptors and alumni interested in advancing community pharmacy practice was the foundation for the development of the “Community Leadership Innovation and Practice (CLIP)” Workshop series that began in 2012-13. Groups of second professional year students act as “clinical pharmacy consultants” who partner with their community pharmacy preceptors to create practice enhancement proposals. Students are expected to have a minimum of 25 patient encounters, conduct a community outreach project, and participate in the class public health project. Students, preceptors and alumni are invited to a series of four CLIP Workshop days, each of which has a nationally recognized keynote speaker and continuing education throughout the day. In 2012-2013, 109 students provided over 3300 individual patient encounters, successfully competed for a national patient care grant, attended Pennsylvania Legislative Day, and engaged national pharmacy chains, independent owners, alumni, residents, and preceptors in discussions and developing innovations in the community. The format of partnering community practitioners and students has increased students’ exposure to successful community pharmacy practices, improved students’ confidence, and led to their envisioning of advancing pharmacy practice. Many students went on to assist pharmacists to further develop patient care practices in their communities.

Design and Implementation of a College-Wide Community Outreach Day. Donald A. Godwin, The University of New Mexico, Megan E. Thompson, The University of New Mexico, Michel B. Disco, The University of New Mexico. The UNM COP has a long history of providing community service to the underserved people of the state. Various groups of student pharmacists often work in siloes to provide these services and the majority of these efforts are concentrated in Albuquerque. Faculty and students of the College worked together to create a coordinated, state-wide effort where classes are canceled for a day and students perform community service. Thus, Community Outreach Day was born. The goals of the day are: (1) to increase access to health information/services to underserved populations throughout New Mexico; (2) to encourage students to participate in community service; and (3) to increase the public’s awareness of the role of pharmacists in healthcare (particularly during National Pharmacists Month). In October 2012, 1,278 middle/high school students were educated about prescription drug abuse; 320 pre-school/elementary students received poison prevention education; 121 patients were screened at health fairs and 1,423 influenza immunizations were administered. The day was so successful; the COP decided to make it an annual event. In October 2013, student pharmacists again fanned out across the state to provide immunizations (1,371 patients), poison prevention presentations (641 students), prescription drug abuse prevention (1,689 students), and health fairs (200 seniors screened). New this year were education and information booths for the Affordable Care Act (207 people) and HIV Education (200 people) and Testing (42 patients). Plans are being made to make Community Outreach Day interprofessional based on interest from the faculty/students of the SOM and CON in collaborating with the COP.

Determining the Most Common Medical Conditions and the Extent of Drug Therapy Problems in a Minority Population Receiving Medication Therapy Management at an Ambulatory Care Free Clinic. David N. Ombengi, Hampton University, Francis A. Ndemo, Hampton University, Ayman M. Noreddin, Hampton University, Wayne T. Harris, Hampton University. Objective: To determine the common medical conditions and associated drug therapy problems in minority patients who received medication therapy management (MTM) services at a Community Free Clinic compared to the findings of the Minnesota Pharmaceutical Care Project (MPCP). Methods: Data from Assurance™ patient documentation system of a sample of 34 patients out of 60 minority patients referred for MTM from January 2012 to January 2013 was evaluated. To be included, the patient must have been diagnosed with a chronic condition, took one or more medications, and had a completed comprehensive medication therapy review. Each patient’s drug therapy was analyzed to determine the most common conditions and any drug therapy problems (DTPs) present, compared to findings of the MPCP. Results: 25 (73%) patients were 51 years and older; 73% female and 27% male. The higher female ratio is comparable to the MPCP finding. The top most common medical conditions were hypertension, Type II diabetes mellitus, and dyslipidemia which is comparable to MPCP. The most frequent DTP per condition were Needs additional drug therapy (48.9%), Dosage too low (16.3%) and Non-adherence (11.6%) which were comparable to the MPCP findings. Conclusion: The results showed that the leading chronic conditions and extent of drug therapy problems in the minority population were comparable to the findings in the Minnesota Project.

Discovering and Serving Oregon’s Diversity through Community Engagement. Gary E. DeLander, Oregon State University, Ann Zweber, Oregon State University, Shannon Starwalt, Oregon State University, Juancho Ramirez, Oregon State University. Community engagement is a hallmark of professional development for students at Oregon State University College of Pharmacy, complementing the University’s Carnegie Community Engagement Classification.
Community engagement is fully integrated in curricular and co-curricular expectations. An emphasis on assuring the needs of a diverse population are met lies at the center of efforts by students, faculty and alumni. Student leadership in community engagement and outreach has long been a co-curricular strengths of OSU student professional associations. More recently, these activities have become essential components of early, intermediate and advanced experiential learning. Opportunities parallel and stimulate student growth and professional development. Early requirements in the P1 and P2 years simply facilitate increasing levels of involvement, while activities in the P3 and P4 years integrate an expectation of leadership and also include more structured interprofessional teams. The creativity in which students, faculty, and alumni have reached out to the diversity of Oregon’s population is impressive. Signature events coupled with health outreach activities, include: ‘Breakin Down the MU’ in which a break dancing competition is utilized to reach out to youth; Vietnamese and Chinese New Year celebrations and Festival Latino provide underserved ethnic minorities access to health screening; and Health Care Equity Week utilizes interprofessional efforts to reach uninsured patients in the Portland metro area. Student assessment indicates that involvement in these and other outreach efforts are key to developing confidence in communication and provision of care to diverse patients often lacking access to quality healthcare.

Diverse and Sustainable Approaches to Student-run Community Engagement Programs. Sally Arif, Midwestern University/Downers Grove, Susan Cornell, Midwestern University/Downers Grove, Sheila Wang, Midwestern University/Downers Grove, Kelly Lempicki, Midwestern University/Downers Grove, Jennifer D’Souza, Midwestern University/Downers Grove. Students of Midwestern University (MWU) Chicago College of Pharmacy are dedicated to serving a culturally diverse society in order to improve healthcare awareness and patient care in the Chicago metro area. Through community outreach and service learning models, our students have developed and sustained free healthcare services through extracurricular activities. Preventative health is an overarching focus for our student-run programs, specifically the MWU Community Health Fair, Asian Healthcare Association (AHA), Collaborative Health Advocate Team (CHAT), Medication Therapy Management (MTM) project, and Middle Eastern Pharmacist Association (MePA). Thirteen years ago the Health Fair was created and now educates over 200 community members annually on health-related topics. As an interdisciplinary event, students and faculty from programs such as pharmacy, medicine and dentistry provide free health screenings and influenza immunizations. Ten years ago, CHAT was established to provide live diabetes educational sessions and screenings to underserved populations with diabetes in various free clinic settings. CHAT’s success has led to a student run Medication Therapy Management (MTM) Program. Since 2012, AHA has offered immunization, laboratory consultation and disease state education on diabetes, hypertension, dyslipidemia, and hepatitis B to approximately 200 Chinese patients in their native language. Established in 2013, MePA has served over 300 members of the Middle Eastern community to raise cardiovascular and diabetes health awareness through educational seminars and screenings in Arabic and English. MWU’s success of community engagement builds from the students’ drive to deliver and sustain public service, partner with community-based advocates and promote wellness in culturally diverse settings.

“Embracing Instructional Assessment in Pharmacy and Health Sciences Education: An evidence-based approach to Professional Development.” Roddrick D. Jones, Texas Southern University, Edward C. Stemley, Texas Southern University. Effective teaching is a complex skill. Measuring effectiveness for the purpose of supporting teacher professional development is more often than not, welcomed; measuring effectiveness for the purpose of rewarding or punishing teachers creates a climate of cynicism, tension and disagreements. Recent studies reveal that teacher evaluations are increasingly relying on student performance measures, which may often refer to a single test. Yet, none of the assessments of student performance, including national and state board examinations, were designed as measures of teacher effectiveness. They were developed to measure students against state or other accreditation standards and/or other students. Formative assessments were designed to provide educators with vigorous information about an individual student’s achievement level and growth that, in turn, would support instructional planning. However, neither summative nor interim assessments were ever intended to be the sole determinants of effective classroom instruction. In effort to promote an enriching teaching experience, we are infusing on-going professional practices, resultant of collaborative instructional assessments, and guided by standardized student ratings and a voluntary peer review process. Based on evaluative data, the College of Pharmacy and Health Sciences has introduced a “course review conceptual model”, which provides a foundation for educators; through student-centered learning strategies. The model emphasizes instructional design and assessment, learners [salient] characteristics, and course management [content focused]. Educational philosophies, lesson plans, plans to enhance professional development and other key evaluations, form the basis for instructor’s portfolios throughout the course review process, while allowing ‘assessment’ of key strategies and content delivery techniques.

Engaging Community Partners to Improve Health: An Innovative Collaboration across Schools and Communities. Leticia Shea, Regis University, James Nash, Regis University, Marianne McCollum, Regis University, Wesley A. Nuffer, University of Colorado, Rodney A. Carter, Regis University. The Regis University School of Pharmacy seeks to develop socially responsible pharmacists who are knowledgeable, skillful, and principled leaders in the service of others. Toward that goal, the school has begun an innovative collaboration with the University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences. With grant funding from the Caring for Colorado Foundation, the two schools are working together to improve the health of Colorado communities across the state. By establishing new pharmacy student-run disease management clinic sites, our students and faculty will engage with community partners to improve health outcomes in rural and underserved populations. This project expands on practices previously demonstrated to be successful by the University of Colorado. During the fourth professional year, students from both schools completing Advanced Pharmacy Practice Experience rotations (APPEs) will provide direct patient care to residents with diabetes and/or cardiovascular disease at clinics established in community pharmacies around the state. The six-month program begins with a complete health assessment and continues with monthly monitoring and education visits. The patient assessment during the final visit allows students to assess health improvements for enrolled individuals and provides data for assessing program-wide effectiveness. Multiple positive outcomes are anticipated. First, we expect that the success of student-run disease management clinics, as measured by improved diabetes and cardiovascular outcomes, will continue. Further, the integration of students from both schools in the same clinics will enhance student relationships across programs. Finally, the collaboration across schools will support the sustainability of this innovative community-based public health intervention.

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Engaging the Little Rock 12th Street Community to Improve Community Health and Advance Student Education. Lanita S. White, University of Arkansas for Medical Sciences, Kathryn K. Neill, University of Arkansas for Medical Sciences, Kate Stewart, University of Arkansas for Medical Sciences, Carla Sparks, University of Arkansas for Medical Sciences, Lisa C. Hutcheson, University of Arkansas for Medical Sciences, Amy M. Franks, University of Arkansas for Medical Sciences, Denise Ragland, University of Arkansas for Medical Sciences. The University of Arkansas for Medical Sciences’ (UAMS) College of Pharmacy (COP) spearheaded the development of the 12th Street Health and Wellness Center, an interprofessional, student-led, community health and wellness center located in a medically underserved community. Citizens are predominately African American, followed by Hispanic and Caucasian, and have lower socioeconomic status and education level than surrounding areas. Goals are to: prevent and improve chronic health conditions, provide health- and disease-related education, promote health literacy, foster interprofessional education, facilitate collaborative practice skills, and promote respect for cultural differences. The Center is led by a Community Advisory Board (CAB), a Student Board of Directors (SBOD) and a Professional Advisory Board (PAB). The CAB serves as the community voice and includes members of the faith community, neighborhood business owners, and community leaders. The SBOD coordinates volunteers, plans and participates in activities, and engages the community. The PAB provides assistance in developing interprofessional experiences and includes representatives from UAMS’ academic units, Interprofessional Education Office, Library, Translational Research Institute, and Center for Diversity Affairs. Interprofessional student and preceptor teams (Pharmacy, Medicine, Nursing, Health Professions, Public Health, Graduate School) provide disease and medication management, dental and health screenings, education, and immunizations. An online module provides an overview of interprofessional roles and clinic activities. Assessment strategies include reflection assignments and a variety of service and research projects to evaluate the Center’s impact on students, patients, and the community. COP students actively participate in the Center’s SBOD, service and research projects, and clinic (IPPEs, APPEs, volunteers).

Engaging the UC College of Pharmacy Community to Promote Health... A Multi-Level Approach. Bethanne Brown, University of Cincinnati. The mission statement of the University of Cincinnati Winkle College of Pharmacy states: “to help contribute to the health of our community and nation through the development of graduates and faculty who will be leaders in pharmacy practice and the pharmaceutical sciences...”. This vision has led to a culture of service observed at all levels within our institution: the Curriculum guided by Administration, taught by Faculty to engage Students. The curriculum is infused with not only core knowledge about population health but also service requirements which connect students to the community by engaging in health care and non-health care related activities. The administration, by providing time, talent, monetary support take an active role in supporting initiatives to improve access to medications and adherence programming. Faculty demonstrate a passion for our community thru service, knowledge and teaching by example. This is demonstrated primarily thru active participation in and mentoring students during health fairs or other community events. Students, by engaging in activities planned thru student organizations, are involved, aware and working to meet community needs. Coordinated thru student governing body, the Tribunal, each student organization is focused on providing services to specific communities either based on national or local initiatives. Examples include health fairs, vaccination events, personal care item drives. Outreach efforts are also interprofessional as student organizations from the various health professions within our institution join forces to drive healthy initiatives. Engagement at all levels allows the efforts to be cohesive, comprehensive and effective at contributing to a healthier community.

Engaging the community: Presbyterian College School of Pharmacy’s (PCSP) Approach. Kayce M. Shealy, Presbyterian College, David H. Eagerton, Presbyterian College, Tiffany B. Threatt, Presbyterian College. Background: PCSP was established in 2010, and will graduate the inaugural class in May 2014. The school is located in Clinton, a rural community in the upstate of South Carolina. The estimated population of Clinton in 2012 was 8,484, with a total of 66,223 people in the surrounding county. The age-adjusted mortality rate for a number of chronic diseases, including diabetes and heart disease, is higher than the state average and the percent of people at or below poverty level is almost double that of the state. Innovations: PCSP has embraced the motto of “Care for the Community”. To that end, the faculty led the charge by developing relationships with key organizations such as the South Carolina Free Clinic Association, among others. These initial relationships allowed students to amplify the impact with both philanthropy and service. Service learning is a major component of the students’ education and it begins during their orientation. During this weeklong orientation, students receive instruction about service learning and join faculty for a day of service within the community. From that point on, each student and organization is encouraged to continue to seek out new service opportunities. Health fairs, medication take back events, and a community 5K are just a few these opportunities. Impact: Since its inception, PCSP students have performed over 4000 hours of service to the community. In addition, over $10000 has been raised for community organizations. It is estimated that approximately one-third of the county population has been reached through these initiatives.

Evaluating the Effect of Community-based, Student-run Educational Outreach on Cervical Cancer Awareness among Vietnamese Women. Eduardo S. Fricovsky, University of California, San Diego, Tri Ho, University of California, San Diego, Vuong Le, University of California, San Diego, Echezona Okoli, University of California, San Diego, Binh Tran, University of California, San Diego and Asian Pacific Health Foundation, Eduardo Fricovsky, University of California, San Diego. UCSD Skaggs School of Pharmacy and Pharmaceutical Sciences, La Jolla, California Are community-based educational outreach seminars that are organized by pharmacy students effective in promoting cervical cancer awareness and improving attitudes towards annual Pap smears among Vietnamese women in San Diego? We hypothesize that pharmacy student-run community outreach educational seminars will boost cervical cancer awareness having a positive impact on attitudes of Vietnamese women towards obtaining annual Pap smear tests after the intervention. Pre- and post-intervention assessment surveys were administered to eighty Vietnamese women at community health fairs organized by the Vietnamese Federation of San Diego. The seminars and assessment surveys were administered in English or Vietnamese based on participant preference. Our study demonstrated that educational seminars led by student pharmacists showed a statistically significant improvement in knowledge about cervical cancer and Pap tests. For example, a greater percentage of women correctly identified the cause of cervical cancer when comparing pre- vs. post-intervention (pre- 18% vs. post- 58%, p<0.05). In addition, a significant difference in favorable attitude change towards obtaining a Pap test was also observed. Prior to the educational intervention, 80% of participants did not plan to receive...
Exposing Students to the Importance of Pharmacy Advocacy. Jacqueline Gregory, Southwestern Oklahoma State University, Christine F. Cox, Southwestern Oklahoma State University, Nancy T. Williams, Southwestern Oklahoma State University. Objectives: To increase student awareness, at our College of Pharmacy, of the importance of pharmacy advocacy, students are recruited to be involved in an annual Legislative Day briefing and health fair. These events are sponsored by state pharmacy organizations and two Oklahoma Colleges of Pharmacy. This exposes students to the importance of their role in promoting their profession to the members of the Oklahoma Legislature and increases their awareness of important pharmacy-related legislative issues and how they can impact their outcomes. In addition, members of the Oklahoma Legislature gain an increased awareness of the pharmacy profession and the health services provided by pharmacists.

Methods: Prior to Legislative Day the students visit the legislative offices to deliver health fair invitations, discuss pharmacy issues and promote the profession. On Legislative Day, which is held in February, students attend a briefing on current pharmacy issues presented by the Oklahoma Pharmacists Association. At the health fair, screenings are provided by faculty, pharmacists, residents and students. Examples of screenings provided include: blood pressure, blood glucose, cholesterol and body mass index. Results: Our students have participated in the annual Legislative Day since 2010. Each year, on average, six students visit legislative offices; twelve attend the briefing; and fourteen are involved in conducting the health fair. In addition, approximately forty-six legislators and their staff receive screenings.

Implications: Pharmacy student involvement at annual Legislative Day events may develop students into advocates for pharmacy and increase the Oklahoma Legislators’ understanding of the profession and the health services offered.

Free Clinic Partnership Promotes Access to Care for the Medically Underserved. Nancy A. Mason, University of Michigan, Anica Mdeo, University of Michigan, Joslyn D. Neal, University of Michigan. Objective: The University of Michigan College of Pharmacy enhances the health of our community through our innovative 10-year partnership with Hope Medical Clinic. Located in a county with no Federally Qualified Health Center, this free clinic serves a diverse population of uninsured patients who speak over 50 languages. Nearly all live on income <200% of the federal poverty level.

Methods: College of Pharmacy volunteers (students, faculty, alumni and preceptors) address unmet needs of the medically underserved by improving access to care through medication assistance programs, dispensing medications and counseling patients, and providing prescriber consultation on a collaborative interprofessional team with the common goal of optimizing patient outcomes. Student coordinators recruit and schedule all student volunteers for regular clinic work and flu clinics. Hope Clinic is an integral partner in our interprofessional Service Learning course for introductory experiential education required for all P1 students. Results: Annually, over 90 pharmacy volunteers spend > 2,000 hours serving 7,000 patient visits, distributing more than $2.6 million in medications, administering almost 150 flu shots, and providing 100% coverage of pharmacy services for weekly Saturday and evening clinics. Impact: Our strong commitment to this community partnership benefits all stakeholders by improving documentation, efficiency, safety, and quality of pharmaceutical care at Hope Medical Clinic. Patients experience reduced costs and increased adherence through improved access to medications. Pharmacy volunteers develop civic responsibility and commitment to social justice while participating in a highly collaborative best-practice environment. Future plans include further development of direct patient care clinical services.

From the College Community to International Partnerships: The Ripple Effect of STLCOP Community Engagement. Tricia M. Berry, St. Louis College of Pharmacy, Scott K. Griggs, St. Louis College of Pharmacy, Toni McMurphy, St. Louis College of Pharmacy, Erica F. Pearce, St. Louis College of Pharmacy, Golden L. Peters, St. Louis College of Pharmacy, Kenneth W. Schafermeyer, St. Louis College of Pharmacy, Kimberly L. Simmons, St. Louis College of Pharmacy, Amy M. Tiemeier, St. Louis College of Pharmacy. St. Louis College of Pharmacy (STLCOP) is committed to making our communities healthier. We believe that this starts with a healthy college community. On our campus, we are focused on improving health through programs such as ‘Bright Spots’ which recognizes students, staff and faculty committed to making a positive difference. We have also held several Town Hall meetings to discuss culture, climate, inclusion and diversity. Annually we encourage students and faculty to engage in community projects: STLCOP CARES, St. Louis Medication Disposal Initiative, and Outreach and Advocacy Day (students have a break from class to participate in advocacy activities at the state capital or outreach activities at places like the St. Louis Science Center and local pharmacies). Additionally, our students, residents and faculty join an interprofessional team of volunteers providing care at a health clinic for the medically underserved in our city. Our faculty and students are involved in a number of other community service projects such as the Consumer Health Information Speaker Series hosted by the St. Louis City Central Library as well as the Walgreens Career Explorers and BEST Pharmacy Summer Institute. Our community service is further extended to the international community. Among our many international activities, we have collaborative partnerships with schools of pharmacy in Mexico, Ethiopia and South Africa as well as the National Guard in Saudi Arabia. In addition to serving in these countries, we have created exchange opportunities for their faculty and students to learn from the STLCOP community.

Health and Wellness: A Community-Based APPE. Jean Anne Mire, Harding University, James M. Nesbit, Harding University. Harding University College of Pharmacy’s mission, in part, is to help address the needs of the world by providing population-based pharmaceutical care that ensures optimal health and wellness outcomes delivered through the highest standards of Christian service. Because Harding is located in a rural area of a small state, we focus on teaching student pharmacists to deliver primary care to largely underserved populations. To highlight our service-centric mission, all P4 students are required to complete an advanced pharmacy practice experience (APPE) in community health and wellness. During the P3 spring semester, students assess a documented need within a given community and develop a project proposal that is submitted to the Assistant Dean for Experiential Education. Subsequently, the P4 student implements the project during a 4-week APPE. This experience allows students to refine their literature retrieval and evaluation skills and practice population-based research design while serving the needs of the community. Approved health and wellness experiences include a variety of evidence-based practice interventions that can be addressed by student-driven, faculty-precepted projects. Wellness services include various activities, such as comprehensive reviews of health behaviors.
(nutrition, physical activity, tobacco use, and vaccinations), personal, family health and community risk factors, childhood education for healthy living, and adherence strategies to improve and/or maintain recommended health goals. This poster presents examples of recent projects that P4 students designed and implemented during the 2012-2014 Health and Wellness Advanced Pharmacy Practice Experiences.

Health and Medication Monitoring Services Provided to the Community through an Introductory Pharmacy Practice Experience. Margaret A. Williamson, Auburn University, Lynn Stevenson, Auburn University, Kathy Kyle, Auburn University, Olivia Shanks, Auburn University, April Staton, Auburn University, Paul W. Jungnickel, Auburn University. Objectives: This poster describes a unique longitudinal experiential learning course that engages the community through a student-led health and medication monitoring service. The purpose of the service is twofold: 1) to provide patients in the community with meaningful assistance with health-related needs and 2) to involve students in the provision of pharmaceutical care as an introductory practice experience. Methods: Approximately 450 student pharmacists in their first through third professional years and 64 faculty members are divided into 28 teams across two campuses. Each team is assigned a caseload of patients for which the students are responsible for providing pharmaceutical care. Students visit patients in their homes and discuss health-related issues and concerns, provide education, and assist with medication adherence. Physicians, senior living facilities, home health agencies, support groups, friends, and family members refer patients to the service on a continual basis. Results: In the 2012-2013 academic year, 352 patients in the Auburn and Mobile communities received regular pharmaceutical care services. Student pharmacists averaged 15 patient encounters per semester. During the same academic period, student pharmacists documented 131 interventions including wellness education, patient counseling, medication reviews, monitoring, and physician follow-up. Implications: This unique introductory pharmacy practice experience engages the community and provides students an opportunity to inform the public about pharmacists and pharmaceutical care. This program not only enhances the education of future pharmacy professionals but also demonstrates Auburn University Harrison School of Pharmacy’s commitment to the health and wellness of the communities it serves.

Home Health Pharmacy: An Innovative Practice Model to Improve Transitions of Care throughout Rhode Island Communities. Virginia A. Lemay, The University of Rhode Island, Kathleen O. Fisher, The University of Rhode Island, Thomas Kalista, Lisa Cohen, The University of Rhode Island. Purpose: To discuss an innovative practice model incorporating faculty, PGY1 community resident and Advanced Community Pharmacy Practice students providing in-home medication reconciliation and medication teaching to patients post-hospital discharge. Methods: Our multidisciplinary model is a collaboration between home healthcare (HHIC) nurses from four visiting nurse agencies (VNA), Healthcenter Advisors, the Medicare Quality Improvement Organization in Rhode Island and practitioners from the College of Pharmacy. Pharmacy students are assigned to one VNA for their six-week rotation, spending three days per week traveling with nurses or physical therapists to patient homes. On the home visits, student pharmacists are trained to perform medication reconciliation, identify medication-related problems (MRPs), create and/or update personalized medication lists, provide medication counseling and disease state education and work collaboratively to resolve MRPs. Data from all patient visits is collected prospectively. Results: Data collection is ongoing. Information collected includes: primary reason for skilled care, primary diagnosis, number of patients visited per month, description of the visit, type(s) of MRPs identified, resolution of MRPs, and the severity of the avoided intervention. The most frequent MRPs identified are adherence issues, adverse drug events and duplication of therapy. Conclusion: Patients are vulnerable to medication errors during transitions of care. Often times, patients are unable to pick up their own prescriptions and lack a relationship with their community pharmacist. Community faculty, PGY1 community residents and student pharmacists can assist high-risk patients by bringing pharmacy into the home care setting to provide smoother transitions of care after hospital discharge.

Howard University College of Pharmacy: Community Engagement through Public Health Service Promotion. Daphne B. Bernard, Howard University, Tamara Foreman McCants, Howard University, Yolanda McKoy-Beach, Howard University, Maritsa Serlimitos-Day, Howard University. Attainment of public health promotion skills as a core program competency is an expectation of all students enrolled in the Howard University College of Pharmacy. In an effort to ensure that all students clearly demonstrate proficiency in this core curriculum area, each student’s professional portfolio must include documentation of completion of two public health outreach activities as a component of the Introductory Pharmacy Practice Experience (IPPE) and the Advanced Pharmacy Practice Experience (APPE) courses. While P1 students are allowed to participate in a public health awareness event, P2, P3 and P4 students must participate in actual service outreach effort to directly impact public health (i.e. providing immunizations or health screenings, etc.) Documentation must include the name and date of the public health event, a description of the activity types of services provided, student’s role in the activity, public health issue addressed by the activity, how current public policy addresses the health issue, barriers to addressing the health issue and how pharmacists can play in overcoming them, name of organization partner, and the name and signature of the supervising pharmacists for the activity. Since 2010, 100% of Howard University pharmacy students have successfully demonstrated competency in public health promotion prior to graduation. The impact of this requirement is that each of our pharmacy students have shown a commitment to providing public health services early in their professional training. Our expectation is that the students will remain fully engaged in ensuring health outcomes in their future service activities.

IPPE and Service Learning: A Blended Course Approach to Population-Based Care and Community Engagement. Janet K. Astle, Duquesne University, Kathleen DeRose, Duquesne University, Jane E. Cavanaugh, Duquesne University, Jennifer P. Elliott, Duquesne University, Suzanne Higginbotham, Duquesne University, Pamela H. Koerner, Duquesne University, Terri Kroh, Duquesne University. Background: Introductory Experiential Education III: Health Promotion/Disease Prevention and Management is the third in a series of introductory practice experiences offered by the School. Its focus is on service learning associated with special populations, educational outreach, promotion of public health, and reinforcement of professional behaviors. As a service learning course, Introductory Experiential Education III has a heavy emphasis on advance preparation, reflective writing, and group discussion. Its genesis was derived from University core curricular requirements for service learning while concurrently meeting accreditation standards that address the need for inclusion of health improvement and population-based care in the curriculum. Description: All students participate in three main course components. The first component consists of participation in screening services that are offered to underserved populations associated with regional food banks. The second component consists of
partnership with local community agencies that provide services to disadvantaged populations. The third component consists of educational outreach consisting either of presentations on chemical dependency to local high schools or safe medication use to local elementary schools. **Assessment Strategies:** This course was offered in its present form in AY 2013-2014. Preliminary assessment strategies include student debriefing discussions and course evaluations. Post-programmatic surveys are also administered as follow-up to school presentations. Future plans include the survey of community partners. **Implications:** Introductory Experiential Education III demonstrates the ability to incorporate service learning in a population-based experience. Its engagement with the community provides an opportunity to foster student civic-mindedness, provide population-based care, and enhance public perception of the profession.

**Impacting Communities through Outreach, Direct Patient Care and Capacity Building**. Veronica S. Young, The University of Texas at Austin, Sharon Rush, The University of Texas at Austin. Community engagement (CEn) strengthens civic responsibility and social accountability in students. With structured preparation, mentoring and thoughtful reflection, CEn can help students develop competency in several subdomains listed under domains 2, 3 and 4 of the 2013 CAPE educational outcomes. Our college-wide CEn efforts are grounded in the following principles: 1) address needs identified by community-based organizations (CBOs); 2) build sustainable relationships based on mutual respect and accountability; 3) promote patient-centered and population-oriented care; 4) encourage student-led initiatives; and 5) foster interprofessional collaborations. Four innovative CEn programs target outreach, direct patient care services and capacity building. Outreach initiatives aim to promote public health outcomes through education and health screenings. Direct patient care services focus on the provision of medication therapy management (MTM) with an emphasis on follow-up to evaluate impact of interventions. Capacity building initiatives are interprofessional and target empowering CBO staff with the resources, knowledge and skills needed to promote quality and patient safety at the population level. Communities served by our programs include seniors, adults with intellectual/developmental disabilities, individuals with HIV/AIDS, economically-disadvantaged families with preschool-aged children, and other underserved populations. Methods of assessing impact on communities vary by programs. Some demonstrated outcomes include improvement in medication knowledge after MTM interventions, referral of participants to providers for follow-up of suspected abnormal lab values during health screenings, and adoption by CBOs of culturally-relevant intervention tools developed to address barriers and specific health needs. Challenges in sustaining services due to program capacity and limited resources continue to be addressed.

**Implementation of Interprofessional Student Community Health Screenings**. Kimberly McKeirnan, Washington State University, Shannon G. Panther, Washington State University, Julie Akers, Washington State University. Recognizing the need to expand clinical screening services provided in a community setting and to increase interprofessional team-based learning, the Washington State University College of Pharmacy invited students and faculty from the WSU Nursing and Nutrition Exercise Physiology programs, Eastern Washington University Physical Therapy, Occupational Therapy, Dental Hygiene, and Speech and Hearing Sciences, and the University of Washington Medical School WWAMI programs to participate. The interprofessional, intercollegiate team organizes and provides screening events for the staff at local K-12 schools. Screenings include blood pressure, blood glucose, bone density, dental oral health, body mass index, body fat percentage, and grip strength. Educational materials are provided regarding concussion, sensory issues, swallowing education, neurodevelopment, and available referral services. Recommendations are provided when abnormal results are identified. Traditional community health screenings provide one-time data for participants but lack continuity of care. The participants must seek out a health screening and use the results to follow up with another provider. The traditional model was redesigned by WSU students to improve patient outcomes through providing patients with multiple, scheduled follow-up visits in their workplace. The new model is also beneficial because interprofessional activities provide the opportunity for students to practice team-based problem solving and refine patient care skills. Success of the health screenings were measured over time through the collection of data regarding participation rates (both students and patients), number of screenings that resulted in abnormal values, and verbal feedback from interprofessional students and the participating staff at local schools.

**Implementation of Student Directed Community Service Projects in the Required Curriculum**. Andrew P. Traynor, Concordia University Wisconsin, Katie L. Valdovinos, Concordia University Wisconsin, Sarah Ray, Concordia University Wisconsin. Introduction: Teamwork, self-direction, leadership and service are skills expected of pharmacists. Second and third year students at Concordia University Wisconsin School of Pharmacy design, deliver and evaluate service projects annually in the required curriculum. Methods: Students are lectured on teamwork, project management and leadership activities in a required 2-credit course each spring semester, second year. During second and third year, in this course and Applied Patient Care Skills VI, students complete service projects. Students are placed into teams and given class time to design a service project meeting their interests and community needs. Students present their plans to a faculty member for approval. Upon delivery, students complete a team report, evaluate peer performance, and complete an individual reflection. Community contacts evaluate student performance. Results: In 2013, 21 second-year and 22 third-year student teams participated. Collectively, 27 activities were educational, 5 fundraising, 9 clinical activities, and 2 were medication/sharps collections. All but two community contacts rated student’s attendance and punctuality, attitude of service, professionalism, and project quality as acceptable or exceptional. Peer evaluations resulted in less than 5% of all ratings related to individual performance on the team as needing improvement. Students reflected positively on the learning experience. Conclusions/Implications: Students performed well in the design, delivery and evaluation of service projects. Incorporating this in the curriculum provides an opportunity for students to practice teamwork, project management and leadership skills and valuable community outreach. Future adjustments include a more specific focus for third year students to fulfill other curriculum requirements.

**Implementation of a Bariatric Surgery Medication Management Service in a Community Hospital Weight Management Center**. Lisa P. DeGennaro, University of Saint Joseph, Bruce E. Edgren, University of Saint Joseph, Joseph R. Ofosu, University of Saint Joseph. More than one-third of adults in the US are obese according to the CDC. Bariatric surgery is an option for the treatment of clinical obesity. Medication management of bariatric surgery patients frequently requires modifications to medication dose and dosage form and adherence to lifelong nutritional supplementation. Few published reports describe the provision of medication therapy management services for bariatric surgery patients or the utilization of pharmacy students in this role. The University of Saint Joseph School of Pharmacy
Improving the Health of Mississippians: A Community-Based Approach. Leigh Ann Ross, The University of Mississippi, Lauren S. Bloodworth, The University of Mississippi, David D. Allen, The University of Mississippi. The University of Mississippi School of Pharmacy (UMSOP) works to improve the health of our state citizens through the daily activities of our educational programs, research efforts, service contributions and clinical practice. In 2008, the School embarked on the development of a comprehensive community-based program that extends beyond the traditional role of academic pharmacy in these areas. The School’s Community-Based Research Program (CBRP) is not simply a project with one specific goal, but a program with multiple arms: implementing Medication Therapy Management (MTM); providing disease education; integrating health information technology; increasing health provider networks in an underserved region; improving health literacy and cultural competency; implementing an employer-based diabetes program; and participating in the Health Resources and Services Administration Patient Safety and Clinical Pharmacy Services Collaborative. These different components of the program have been implemented in targeted communities in underserved counties where the UMSOP partnered with community pharmacists, physician groups, community health centers, employer groups and other local or regional organizations. Health screenings have been conducted to assess patients at-risk for adverse outcomes from chronic diseases and MTM visits have been conducted by pharmacists/residents/student pharmacists. Clinical, humanistic, and economic data indicates a positive impact in the targeted communities. From the CBRP, a PGY1 Community Pharmacy Residency Program was established and accredited, and residents provide MTM services in these communities. Student pharmacists participate in pharmacy services in the communities through Introductory and Advanced Pharmacy Practice Experiences and by volunteering for service learning.

Inclusion of Healthcare Related Community Service in the Marshall University Pharmacy Curriculum. Kimberly A. Brodel-Zaugg, Marshall University, Janet Wolcott, Marshall University, Craig A. Kimble, Marshall University, Leesa M. Prunty, Marshall University, Brittany L. Riley, Marshall University, Robert B. Stanton, Marshall University. From inception with the first entering class in 2012, MUSOP has encouraged students to take an active role in our community. During our first year, students participated in traditional community service opportunities as well as developing new services. Within the program’s first 5 weeks, pharmacy students helped a local hospital with Senior Fest where 1,000 senior citizens attend this health-care festival annually. Our students provided brown bag counseling, served as ambassadors, and helped prepare the paperwork for flu vaccines. Additionally, in the spring, students helped with the regional Geri Olympics event. They assisted the elderly in participating in various physical competitions. Each year for the Homeless Coalition, our students have gathered donations, distributed medication cards, and offered OTC advice at their event that helps people find appropriate assistance. Each month, a faculty member and student visit the local homeless community to provide medications and counseling. The families at the local Ronald McDonald House have benefited from a Super Bowl Party provided by our students. The food bank received donations from our students at the end of the semester when they cleaned out their pantries to donate non-perishables. MUSOP co-sponsored a poster contest called “Above the Influence” with the Cabell County Substance Abuse Prevention Partnership. This project was to increase secondary school pupils’ awareness of chemical addiction. Assessment was completed through individual student self-reflection papers, in-class presentations, number of hours completed, and numerous thank you notes sent from receptive community partners. Photos were posted in MUSOP’s lobby and local media outlets.

Innovations in Community Engagement at the University of Connecticut. Devra Khanh Dang, University of Connecticut, Philip M. Hritcko, University of Connecticut, Peter J. Tyczkowski, University of Connecticut. Objective: Providing patient-centered care is the foundation of pharmacy practice. Pharmacists need to be active within the communities where they live and practice. Methods: The school of pharmacy has a long tradition of meeting the university’s land-grant mission and is one of the leaders in health-related community outreach at UConn. Our faculty and students engage in both intraprofessional and interprofessional outreach to a variety of populations across multiple settings. The interprofessional Urban Service Track (UST) allows pharmacy students the opportunity to provide outreach with multiple health professions. This curricular collaboration across six health profession schools aims to produce future health care professionals dedicated to caring for urban underserved populations and interprofessional teamwork. UST pharmacy students work in interprofessional teams to provide clinical care, health-related education, and engage in advocacy efforts on behalf of urban populations. Pharmacy students also provide clinical care to migrant workers at farms throughout Connecticut and at free clinics in homeless shelters. The office of educational outreach organizes other major initiatives such as helping patients to select a Medicare Part D plan and having pharmacy students trained as Assisters to help community members navigate Connecticut’s health exchange. Results: UST students and faculty reach approximately 4,000-5,000 of Connecticut’s neediest citizens each year. Assessment of the impact on student skills and attitude is accomplished via validated instruments, reflection papers, and formal discussions with faculty. Implications: These programs provide students opportunities to learn and reinforce clinical and communication skills, cultural sensitivity, and interprofessional teamwork while giving back to their community.

Innovations in Community Engagement: Unique Pharmacy Related Opportunities for Students on APPE Rotations. Paula J. Evans, MCPHS University – Worcester/Manchester, Colleen Massey, MCPHS University – Worcester/Manchester, Adriana Cabrera, MCPHS University – Worcester/Manchester, Donna Bartlett, MCPHS University – Worcester/Manchester, Sheila Seed, MCPHS University – Worcester/Manchester. Out-of-classroom opportunities for students to develop leadership, interpersonal, and communication skills are essential for pharmacy students. Community-based engagement where students apply their knowledge can positively affect skill development. Three experiences where these skills can be developed and exercised are provided for students on Advanced Pharmacy Practice Experience (APPE) rotations. The Free Medical Program is affiliated with a local hospital to provide acute and chronic health services to over 1300 underinsured or uninsured primarily non-English speaking patients on an annual basis. Under faculty supervision, students work closely with interpreters to counsel patients on their prescriptions and provide cost effective options for obtaining their medications. Students also work with physicians and nurses to research medications brought in by patients from foreign countries to find comparable products available in the U.S. The MCPHS University Pharmacy Outreach Program provides over 1,100 Medicare Part D plan evaluations during the annual open enrollment period from October 15 through December 7. Students on rotation provide researched plan suggestions taking into consideration many variables including medication regimen, secondary insurance, cost, pharmacy networks, and formulary restrictions. Students educate beneficiaries on plan benefit cost and design, and alternative medications. “Ask the Pharmacist” is a program affiliated with two Title III funded agencies and the University, and provides presentations on medication safety and management to over 850 older adults and individualized medication consultations to approximately 350 older adults on an annual basis. Under faculty supervision, students create and deliver educational programs and communicate clinical information to participants.

Innovative Approaches for Students to Impact Community Health. Joshua Caballero, Nova Southeastern University, Zaher Hajar, Nova Southeastern University, Stacia Schaefer, Nova Southeastern University, Barry A. Bleidt, Nova Southeastern University, Robert McGorry, Nova Southeastern University. Professional students become involved in community health activities for numerous reasons. Faculty at Nova Southeastern University College of Pharmacy guide student participation into programs that optimize student learning while maximizing college resources. Novel approaches to community service have been constructed respectively around interprofessional education (IPE) initiatives and partnership with the pharmaceutical industry (PI). Pharmacy and dental students work together in an HIV dental clinic to identify ongoing health needs and optimization of care. Students perform medication reconciliation in partnership to identify underlying diseases, current complaints, medication use (e.g., doses, duplication, interactions, adverse effects) prior to dental work and administration of anesthesia. Dental and pharmacy students have worked collaboratively to improve patient care. Medication reconciliation and patient education have accounted for over 75% of the interventions. Student societies work with PI to educate the public on health issues. Cardinal Health (Dublin, Ohio) funds the Generation Rx® program in conjunction with Colleges of Pharmacy to educate the public on the dangers of prescription medication abuse. APHA-ASP members constructed a strategy to display the social and legal ramifications of drug abuse. A presentation or a mock trial was performed at three high schools to illustrate the consequences associated with drug convictions. Students completed a survey to document the effect the sessions had on their perception of prescription drug abuse behavior. Success was determined by the interactions with students and invitations to return for additional mock trials. Community health can benefit from student participation in extracurricular activities targeting innovative approaches to patient interaction.

Innovative Community Partnerships to Enhance Education and Healthcare Delivery. George E. Francisco, The University of Georgia, Bradley G. Phillips, The University of Georgia, Catherine D. Bourg, The University of Georgia, Merrill Norton, The University of Georgia, Trina J. von Waldner, The University of Georgia, Kay L. Brooks, The University of Georgia. Background: As a land-grant and sea-grant university, one of the University of Georgia’s (UGA) missions is to translate advances in research and knowledge to improve communities and the daily lives of Georgians. The College of Pharmacy leads this charge through innovative community partnerships that improve pharmaceutical care and health outcomes throughout the state. Objective: The UGA College of Pharmacy established novel partnerships to educate students and improve health outcomes locally and across communities throughout the state. Innovative partnerships include state-wide collaborations with other universities, state governments and health-systems. At the local level, key partnerships with indigent care organizations, county governments, community pharmacies and clinics have improved health outcomes community-wide, including underserved populations Results: Through state-wide partnerships, faculty and students help deliver interprofessional health-care to 1) migrant workers through the Farm Worker Family Health Program, 2) K-12 schools to decrease drug abuse in partnership with the State Board of Education, and 3) transplant patients through the Medication Access Program (MAP). Key partnerships at the local level with county governments, clinics and community pharmacies
Integrating Experiential Education to Enhance Patient Care in the Underserved Communities. Gina M. Prescott, University at Buffalo, The State University of New York, Peter M. Brody, University at Buffalo, The State University of New York, Linda M. Catanzaro, University at Buffalo, The State University of New York, Irene S. Hong, University at Buffalo, The State University of New York, Karl Fiebelkorn, University at Buffalo, The State University of New York. 

Objective: Healthcare disparities in the underserved population affect millions of Americans. The underserved are often of minority race/ethnicity, lower socioeconomic status, and lack access to health coverage and quality of care. In response, our school has developed experiential opportunities to enhance healthcare in our underserved communities. 

Activities: Annually, pharmacy students at the University at Buffalo (UB) complete approximately 1500 hours of introductory pharmacy practice experiences in community pharmacies and conduct about 25 wellness clinics in underserved areas. Students also provide poison prevention and general health education at 2 local refugee institutes. To promote medication safety in our communities, students and faculty participate in the Drug Enforcement Administration’s semi-annual drug take back programs in 2 underserved areas. Additionally, students have led a grant-funded wellness clinic, annual over-the-counter medication drives, and collaborate with medical students in patient education at local homeless shelters. Since 2011, UB pharmacy faculty, students, and residents participate in interdisciplinary teams at a local free clinic. Services include provision of free or reduced cost medications to patients through donations and patient assistance programs (PAPs), counseling on medications and diseases, consultation to providers and medical students on medications, and health awareness classes to the community. Over 1200 patients have received pharmacy care to date. Most commonly documented services include enrollment of patients (n = 145) in PAPs, renewal of PAP applications (n = 390), refill assistance (n = 188), and patient education (n = 147). 

Conclusion: Integration of experiential education may enhance healthcare to the underserved. Efforts to maintain these initiatives and develop new services are underway.

Integration of Community Service: Meeting Needs while Meeting the Mission. Aleda M. Chen, Cedarville University, Ginger Cameron, Cedarville University, Thad Franz, Cedarville University. The Accreditation Council for Pharmacy Education, in their standards, challenges schools to serve local community needs. Thus, Cedarville University School of Pharmacy endeavors “to equip graduates for service ... maintaining a particular sensitivity to the underserved.” Therefore, we work with two organizations in our local area to improve the health of their communities: Circles and STEPS. Circles is a community-based initiative in Springfield, Ohio that helps people out of poverty by providing them with financial, emotional, and social resources. The goal of Circles is not only to end poverty, but to change the entire perception of poverty within the community. Partnering with Circles, Cedarville student pharmacists provide monthly health-education topics (children’s obesity and health, over-the-counter products, stress and smoking cessation) and services (flu vaccinations, medication reconciliation, and health screenings). Outcomes of this partnership have been positive; one example is most individuals receiving the flu vaccination. Secondly, student pharmacists work inter-professionally with medical and nursing students from Wright State University as part of STEPS (Students Teaching Educational Plans for Success) at St. Vincent de Paul Gateway Men’s Shelter in Dayton, Ohio. This is a shelter where men without a place to live can go to find temporary housing, food, clothing, and support with the goal of achieving self-sufficiency. Students volunteer two Saturday mornings monthly, using motivational interviewing to evaluate, educate, and empower men to take charge of their health and make changes to improve their day-to-day wellness. As a result, we have seen several men begin to achieve their health goals.

Interprofessional Collaboration Between Pharmacy, Physical Therapy, and Occupational Therapy Students in a Chronic Pain Clinic. Debra K. Farver, South Dakota State University, James R. Clem, South Dakota State University, Dennis D. Hedge, South Dakota State University. A student lead community health clinic was established to demonstrate that interprofessional teamwork can improve chronic pain management for underserved patients. Fourth year pharmacy students completing a Community Health Advanced Pharmacy Practice Experience were paired with physical and occupational therapy students at Falls Community Health whose mission is to be an open door to quality health care services by removing barriers. The objectives were to recognize psychosocial factors associated with the patients’ pain, actively assist in establishing programs addressing specific functional tasks for patients, develop an appropriate plan of care for patients presenting with chronic pain as related to pharmacologic and non-pharmacologic methods, and reinforce education of patients on appropriate use of their medications and encourage follow-through with safety and monitoring regimens. The student lead teams reviewed the medical history and previous clinic visits before interviewing and assessing the patient at their appointments. For assessment of chronic pain, the students used the multidimensional pain assessment tool (PQRST). Pharmacy students were responsible for reconciling medications, determining appropriateness of pain medications, and developing recommendations to modify and/or improve pain control taking into consideration psychosocial factors i.e. financial, medication diversion, etc. The student lead teams than developed a long term plan for the patient which was incorporated into the medical record. Improvement in chronic pain management was determined by reassessment of the patient in follow-up visits or through telephone contacts. Students have learned what other health professions can contribute to patient care and how to work as a team to enhance patient care.

Introductory Pharmacy Practice Experience (IPPE) Students Protect Nearly 100,000 Coloradans. Kari L. Franson, University of Colorado, Wesley A. Nuffer, University of Colorado, Eric H. Gilliam, University of Colorado, Christopher J. Turner, University of Colorado. Introduction: It is well-recognized that PharmD students under appropriate supervision can provide safe and effective patient care services. Accordingly, to apply modern educational methods and to take maximum advantage of time, it is important to develop students’ abilities to apply the full spectrum of pharmacy practice competencies in direct patient care activities on a continuous basis starting early in the PharmD program. Skaggs School of Pharmacy & Pharmaceutical Sciences (SSPPS) as part of its IPPE program, has required 2nd and 3rd-year students to provide immunizations in community pharmacies since 2003 as a way to provide community health-promotion and disease prevention services and to build students’ experience in shouldering responsibility for direct patient care.
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**Leveraging the Pharmacists Clinic for Outreach and Engagement within the UBC Community.** Barbara Gobis, The University of British Columbia, Larry Leung, The University of British Columbia, Jason Min, The University of British Columbia, Michele Mayorga, The University of British Columbia, Peter Zed, The University of British Columbia. The Pharmacists Clinic is Canada’s first licensed, university-owned, pharmacist-led patient care environment. Here student pharmacists observe and provide medication management services to real patients in a supportive best practices environment. This submission highlights three initiatives involving the Clinic team and student pharmacist volunteers that contribute to a healthier UBC community: 1) Vaccination services. Student pharmacists with authorization to administer immunizations participated in two influenza vaccination initiatives in November 2013 – one for faculty and staff coordinated through UBC Risk Management Services, and one for anyone else coordinated by the Pharmacists Clinic. Students gained valuable hands-on experience and recipients had convenient access to immunization. 2) Heart health risk assessments. Student pharmacists participated in a series of traveling health fairs around campus where health measurements, risk scores and patient interviews and assessments were completed. UBC employees learned about risk factors and made personal health goals while students gained confidence through these patient interactions. 3) Inter-professional care of denture patients. Student pharmacists worked collaboratively with dental students in the interview and assessment of prosthodontics patients. Student pharmacists completed medication assessments and care plans for drug therapy problems. Clinic pharmacists provided subsequent care to patients in need of follow-up while students observed. Student pharmacists and dentists learned about inter-professional collaboration and the complementary roles each other has in patient care. Over 65 student pharmacists participated in the care of hundreds of patients in these 3 initiatives. Patient and student feedback was positive and more outreach and engagement are planned for the future.

**Design:** Students were trained to administer vaccines through the American Pharmacists Association’s Pharmacy-Based Immunization Delivery Certificate program and supervised by immunization-certified pharmacists. Students initially participated in community pharmacy-based dedicated immunization clinics but, when the dedicated clinics were phased out, they provided immunizations to walk-in patients as part of their community pharmacy-based IPPE activities. **Results:** A total of 90,702 patients have been immunized in community pharmacy settings by Colorado IPPE students. The early dedicated immunization clinics provided each student an average of 50 patients immunized per year. Walk-in opportunities provided each student with an average of 35 patients immunized per year. **Conclusion:** SSPPS students have demonstrated their ability to deliver substantial and meaningful health care services and accept responsibility for direct patient care from an early point in the PharmD program.

**LECOM School of Pharmacy - Meeting the Needs of our Under-served Neighbors.** Michael J. Mueller, Lake Erie College of Osteopathic Medicine, Katherine M. Tromp, Lake Erie College of Osteopathic Medicine, Alejandro Vazquez, Lake Erie College of Osteopathic Medicine, Marcus W. Campbell, Lake Erie College of Osteopathic Medicine, Julie J. Wilkinson, Lake Erie College of Osteopathic Medicine. LECOM School of Pharmacy aims to prepare pharmacy professionals to serve the needs of a diverse population. At the Bradenton, Florida campus two practicum sites have been established to afford the traditional four-year and distance education students with the opportunity to provide care to our underserved neighbors in the Bradenton/Sarasota area. Serving as an ambulatory care and community APPE rotation site, the Good Samaritan Pharmacy and Health Services mission is to assist uninsured and underinsured Sarasota County residents in obtaining their routine prescription medication so that no one has to choose between food and life. The site has a licensed dispensing pharmacy and patient advocates that assist patients with patient assistance programs (PAPs). Additional LECOM faculty and student volunteers, outside of those associated with APPEs, assist with the day-to-day operations of the site. There are also faculty and student representatives that serve on the board of directors. The One Stop Clinic offered by Turning Points is an interdisciplinary location offering patients medical, dental and pharmacy care. The mission of this site is to provide, coordinate, and facilitate services to the homeless, as well as those at risk of becoming homeless in Manatee County, Florida. Students on their ambulatory care rotation at this site work with a practice faculty member to coordinate services for the patients in need. LECOM student organizations also visit the site throughout the year to conduct community events focused on educating patients about proper health care and the important role pharmacists play in their healthcare.

**Local to Global: Innovations in Community Engagement.** Tina C. Lopez, University of the Incarnate Word, Bradi L. Frei, University of the Incarnate Word, Christine Whong, University of the Incarnate Word, Anita T. Mosley, University of the Incarnate Word, Sushma Ramsinghani, University of the Incarnate Word, Cynthia N. Nguyen, University of the Incarnate Word, Arcelia M. Johnson-Fannin, University of the Incarnate Word, Locally, FSOP engages our community through health fairs and an interprofessional clinic. Student organizations conduct multiple health fairs annually for the underserved community. One of these annual health fairs targets the refugee population and has served over 135 people. A grant from Wal-Mart Foundation has allowed over 600 people to be screened for cholesterol, glucose, hearing, nutrition, medication education, and many other services. One of our interprofessional projects is a HRSA funded demonstration grant to establish a clinic that provides patient-centered care with nurse-led teams to improve patients’ overall quality of life. Globally, we have many faculty-led, interprofessional activities including study abroad trips and international APPE rotations which facilitate student learning through community engagement. Recent trips to China and India promoted interprofessional relationships between pharmacy, nursing, nutrition, and healthcare administration students. Annually, 4 APPE students prepare the formulary, pack medications, and fill 5,000 prescriptions during a one-week medical mission with Los Quijotes in Mexico. The school has completed funding for one water well and started another in Africa through Pennies for Water. Lastly, as a member of the Women’s Global Connection, one of our
distinguished faculty initiated a public health project in a village in Tanzania Africa to provide rain water harvesters for their Clean Water Project. FSOP engages the local and global community through health fairs, faculty projects, and healthcare study abroad and medical missions.

No Place like Home: A Longitudinal Ambulatory Clinical Interprofessional Education Experience. Catherine L. Hatfield, University of Houston, Anne Gill, Baylor College of Medicine, Chip Lambert, University of Houston, Nancy D. Ordonez, University of Houston, Elizabeth A. Nelson, Baylor College of Medicine. In the past four years, University of Houston (UH) College of Pharmacy has begun to aggressively pursue expanded interprofessional education initiatives with some of its academic partners. One such collaboration is with Baylor College of Medicine’s (BCM) “No Place Like Home” program, one of the several Longitudinal Ambulatory Clinical Experience course tracks for its third-year medical students. In cooperation with Harris Health System, the program delivers in-home ambulatory care services by nurse practitioners and physicians to Houston-area geriatric patients who are predominantly homebound due to mobility limitations typically resulting from comorbidities. The interprofessional education component of the program integrates pairs of BCM medical and UH pharmacy students into the healthcare team during the home visits. Following a pilot stage in spring 2012, UHCO and BCM expanded the program to more than 40 pharmacy and medical students from each institution in the 2012-13 academic year and had additional growth in the 2013-14 academic year. By interacting with patients in their home environment, the interprofessional team is able to observe aspects of patients’ normal routine and make adjustments to the care plan or even suggest changes in behavioral practices that might not otherwise be apparent. The benefits of the interprofessional team approach were immediately realized by the participants, as the strengths of each profession were utilized to provide unique perspectives for developing or modifying the care plan.

OTC Utilization and Underserved Families: Creating a Sustainable, Interprofessional Model. Doug A. Meyer, Pacific University Oregon, Jennifer M. Jordan, Pacific University Oregon, Brittany S. Cummiskey, Pacific University Oregon, Crystal G. Chu, Pacific University Oregon, Reza Karimi, Pacific University Oregon. Good Neighbor Center (GNC) provides short term housing, food and other services to families facing homelessness. Up to 9 families are provided private living space and meals for up to 6 weeks. GNC had a medicine closet with OTC products, including duplicates, indication gaps and expired medications. Students involved with Project Chance, an APHA-ASP initiative, “adopted” the GNC in September 2013 after visiting during a school Service Day. The goal was to create a sustainable, interprofessional model that would promote safe and effective OTC utilization for underserved families in the short term, and to apply the model to similar shelters in the future. Services provided by students and faculty at GNC include: organizing OTC products (removed expired, re-supplied, labeled by indication to prevent misuse, created info sheets, establish an OTC formulary), providing influenza vaccines and developing education modules for students to present. Modules are repeated every 2 months to new GNC families, including children. Module topics include: reading medication labels, OTC indications, “Brand vs. Generic”, and “Cold vs. Flu” and they can be repeated by different students in the future. Dental hygiene students have also participated to provide information about brushing and flossing to families. Future goals for the project include continuation of the program with new Project Chance members and dental hygiene students, securing funding donations to replenish OTC supplies (bake sales have funded the project thus far), and ideally, applying this model to other shelters that provide housing and other services to families experiencing temporary homelessness.

Partnering with a Community-based Social Service Agency to Promote Optimal Medication Use. Joseph P. Nathan, Long Island University, Tina Zerilli, Long Island University, Sara Grossman, Long Island University. Background: Heights and Hills (H&H) is a non-profit social service agency servicing elderly, community-dwelling adults in Brooklyn, NY. The Agency’s case managers document their clients’ medication regimens during routine home visits. Previously these regimens were not assessed for drug-related issues. Objective: To promote optimal medication use by H&H clients while providing learning opportunities for LIU Pharmacy students. Methods: In late 2012, the staff of the International Drug Information Center (IDIC) of LIU Pharmacy collaborated with H&H to develop mutually beneficial partnership. The partnership’s initial program entailed reviews of H&H clients’ medication regimens by students completing their advanced pharmacy practice experience in drug information at the IDIC and by the IDIC staff. Written reports were to be provided to clients with recommendations and education concerning their medications. The program was developed with assistance from a student in LIU’s Masters of Public Health program. Results: Since the program’s implementation in April 2013, more than 200 reports were generated. The reports addressed issues requiring immediate attention (e.g., inappropriate doses, therapy duplication) and general comments (e.g., cost minimization, major counseling points). As the program progresses, a detailed analysis of the numbers and types of drug-related issues identified and counseling points provided in the reports will be assessed. Clients’ perceptions of the usefulness of the reports will also be evaluated. Implications: The partnership with H&H strengthens the relationship between LIU Pharmacy and its surrounding communities, offers learning opportunities for LIU Pharmacy students, and provides a framework for future interprofessional collaboration within the community.

Pharmacists and Student Pharmacists Educate Patients in Recovery. Cassandra Beyerle, Sullivan University, Holly L. Byrnes, Sullivan University, Amber Cann, Sullivan University, Sharlonda Nunn, Angela Park. For the 50th anniversary celebration of Sullivan University, every college participated in a yearlong service project through Wayside Christian Mission. The Mission is dedicated to restoring the lives of homeless in Louisville, Kentucky and offers a Sober Living Program, where our efforts were focused. The College of Pharmacy focused on health education, medication awareness, and education of family members of those recovering from addiction. Two programs ran in tandem; first, on a monthly basis one faculty member and several student pharmacists presented to a group of women residents, participants of the Sober Living Program, who were recovering from addiction. Sessions included an education portion followed by questions and medication reviews. The topics ranged from diabetes to arthritis to STIs. The second piece included programs on substance abuse prevention to at-risk adults and children. The participants were family members and children of those in the Sober Living Program. The community service was assessed by attendance and resident/family member participation. Each activity was highly attended and full participation was noted by presenters. The project was so well received that the directors of Wayside requested more. The next phase of the project is to create and assess patient education videos covering various topics. These videos will be available for viewing on Wayside’s website and by the clients. The effectiveness of the videos will be assessed by pre- and post- knowledge surveys completed by Sober Living Program residents. There will also be a focus on education regarding the importance of pharmacists in addiction medicine.
Pharmacy Involvement at the Equal Access Clinic Network to Reduce Prescription Costs: A Student Led Intervention Program.

Eric A. Dietrich, University of Florida, Jordana Wollmann, University of Florida, Erin Kurien, University of Florida. The Equal Access Clinic Network (EACN) is a network of student-run free healthcare clinics that serve the medically underserved in Alachua County, FL. Established in 1992 by students from the UF College of Medicine, EACN has expanded to four nights/week. In 2008 the College of Pharmacy was invited to participate and currently practices interdisciplinary care with students of medicine, dentistry, physical therapy and psychology. Established roles included offering point-of-care testing (HbA1c, glucose), recommendations for pharmacotherapy and monitoring, low-cost alternatives, and counseling. In 2009 a local pharmacy was contracted to allow EACN to pay for medications for those unable to afford them. In 2013, EACN experienced significant budget cuts, mainly impacting point-of-care testing, medications and labs. Pharmacy was consulted by EACN to decrease prescription costs and increase patient access. Solutions implemented by student pharmacists included the following: development of protocols to help identify and enroll patients in Patient Medication Assistance Programs (PMAPs) for high-cost medications such as inhalers for respiratory disease and insulin; protocol to enroll insulin-requiring diabetics into the Florida Department of Health Insulin Distribution Program; screen prescriptions for less expensive therapeutic alternatives; developed criteria-for-use for EACN-paid medications; and provide medication reconciliation by student pharmacists to patients using 3 or more medications. A review of prescriptions from the calendar year 2013 demonstrates a sharp decline in prescription costs at EACN before and after policy changes made by pharmacy officers in May 2013. Prior to May average cost was $1,365.20 (January – April 2013); after intervention costs averaged $118.98 (May – December 2013).

Pharmacy Service Projects in a Dual Campus Model: A Tale of Two Cities.

Mark Decerbo, Roseman University of Health Sciences, Renee Holder, Roseman University of Health Sciences, Erin L. Johanson, Roseman University of Health Sciences, Christina Madison, Roseman University of Health Sciences, Phuong Vo, Fourth Street Clinic, Salt Lake City, UT. Background: Roseman University College of Pharmacy (RUCOP) was the first institution in Nevada to grant the Doctor of Pharmacy degree. The inaugural class enrolled in 2001, and the South Jordan, Utah campus opened in 2006. Each community faces distinct public health concerns. The RU core values of risk-taking and innovation have been embraced to improve the health and health literacy of its communities, and offer students unique educational opportunities. Henderson: Las Vegas metropolitan area has a dense Asian Pacific Islander (API) population. API are at increased risk for hepatitis B infection, and ultimately hepatocellular carcinoma. API also have limited English proficiency. Since 2011, RUCOP and HepBFree Las Vegas have partnered to increase access to screening, prevention, and treatment through student pharmacist volunteers. Students provide in-language services during each point of contact, and serve as medication educators and vaccine administrators. South Jordan: Salt Lake City metropolitan area has seen a recent increase in the prevalence of homelessness. Homelessness is associated with poorer overall health and graver complications from acute and chronic conditions. This population also has less education and reduced access to primary healthcare. RUCOP has partnered with the 4th Street Clinic since 2010 to provide indigent healthcare services primarily through an Advanced Pharmacy Practice Experience. Students deliver medication therapy management services and diabetes education. Future Directions: Creating similar services for additional at-risk populations, mirroring existing models to provide complimentary services in both communities, and developing residency programs with an indigent care focus are examples of ongoing dedication to community engagement.

Practice What You Preach: Walking the Walk and Talking the Talk for Personal Health and Wellness.

Melissa Mattison, Western New England University, Joshua J. Spooner, Western New England University, Eric C. Nemec, Western New England University, Beth E. Welch, Western New England University. Pharmacists are expected to be advocates of public health and wellness. In order to embrace this role, these attributes need to start within. Faculty from the Western New England University College of Pharmacy developed an innovative immersive elective on Lifestyle Medicine. This elective - entitled “Health, Wellness, and Fitness” - provided a hands-on approach for learners to better appreciate the challenges of the lifestyle changes frequently recommended to promote health and wellness. This 3 credit elective was offered to PY-3 learners and included setting personal lifestyle goals, completing the Presidential Adult Fitness Challenge, preparing Composite Lifestyle Indices, participating in the Couch to 5K® program, and education on a variety of lifestyle medication concepts. This course culminated in a 5k race benefitting a local YMCA. The community that this elective engaged was its own educational community. The first offering of this course was to 17 learners, but the impact was demonstrated by a much larger community. Soon other learners, faculty, and staff were seen running across campus each week as a unified group. The College of Pharmacy name was proudly displayed on the T-shirts of the 5k runners. Non-enrolled learners joined the event to promote health and wellness by screening blood pressures. Educating pharmacy learners in lifestyle modifications is imperative to affect a change in the lives of patients and the community for which they serve. In order to contribute to a healthier community, one must start with self.

Prescription Drug Abuse Prevention in East Tennessee: Engaging Communities to Impact an Epidemic.

Jeffrey A. Gray, East Tennessee State University, Nicholas E. Hagemeier, East Tennessee State University, Sarah T. Melton, East Tennessee State University. Prescription drug abuse (PDA) is an epidemic nationwide and has disproportionately impacted the Southern Appalachian region. Situated within a geographic area known for pervasive PDA and its consequences, The Gatton College of Pharmacy and Academic Health Sciences Center (AHSC) at East Tennessee State University are proactively engaging the Region and its health professions students to address the problem. Over the College’s six-year history of community engagement in PDA, efforts have focused on primary prevention activities, PDA treatment, awareness, education, and interprofessional collaboration as the key impact sectors. Notable programs include Generation Rx, Operation Rx Disposal, continuing education (CE) programming, and establishment of the ETSU Diversity-promoting Institutions Drug Abuse Research Program. In 2013-2014, 3 faculty and 38 Generation Rx pharmacy students engaged 4000 children and adolescents in PDA prevention education. Operation Rx Disposal employed 5 faculty members and 35 student pharmacists to assist more than 1000 households in removing unwanted medication from their homes through conduction of drug take-back events. Over 2000 health care providers from regional communities participated in PDA CE events conducted by 3 pharmacy faculty members. Additionally, 3 externally funded, PDA-specific grants totaling $2.26 million were awarded to pharmacy faculty members to engage communities, health care professionals, and students in innovative PDA prevention research. The College’s efforts have been nationally recognized by
peers, professional organizations, state boards of pharmacy and within the evidentiary literature.

Project Population Health and Rural Medicine (PHARM). Sean R. King, Union University, Erica Rogers. Objectives: To alleviate burdens associated with heart disease, stroke and inadequate functional health literacy (FHL) and increase access to care for the underserved within our community, while expanding public health educational opportunities for our students. Methods: Project PHARM is an interdisciplinary endeavor consisting of representatives from pharmacy, nursing and social work that supports the goals of the Million Hearts™ Campaign and addresses the Healthy People 2020 Leading Health Indicator Clinical Preventative Services. Project PHARM utilizes a research and community service learning component to provide free health screenings and education and assess the benefits to the underserved within our community. Results: Project PHARM contributed health numbers from approximately 300 individuals to the Million Hearts Campaign last year alone. An additional 214 individuals received free health screenings and education at Project PHARM sponsored events. We continuously assess medication profiles of patients for adherence to cholesterol, hypertension and/or diabetes medications and collect information of significance to the goals of the Million Hearts Campaign. Independent samples t-test are used to determine if those possessing inadequate FHL differs from those possessing adequate FHL in adherence to the study medications. Implications: Project PHARM serves as a model for effectively creating and utilizing interdisciplinary collaborations between various healthcare providers. Activities associated with Project PHARM assist our students and the community we serve to better understand the role pharmacists play in providing access to affordable healthcare. Project PHARM is positively impacting our community and reaching a population that may otherwise not have access to these important health services.

Promoting Community Engagement and Advocacy across the Pharmacy Curriculum. Michael J. Avaltroni, Fairleigh Dickinson University, Anastasia M. Rivkin, Fairleigh Dickinson University, Barbara A. Rossi, Fairleigh Dickinson University, Chadwin Sandifer, Fairleigh Dickinson University. The Fairleigh Dickinson School of Pharmacy has identified one of its core values as “Advocate”. Promotion of this value throughout the curriculum and within extracurricular activities has been a key to building a culture of care and commitment to patients, fellow pharmacists, other health professionals and the profession of pharmacy. Using a series of programs, the School of Pharmacy has called upon students to serve within activities that begin during the student orientation and carry on through didactic and professional course work, extracurricular activities, service learning opportunities and other areas of community engagement. The penultimate goal will be to produce graduates who identify the value and vision of advocacy as a key component to the health professions and draw on their scholarly experience to apply this value in their career for the purpose of advancing the vision of patient care within the profession.

Promoting Interprofessional Education through a Student led Community Health Screening Event. Carrie M. Maffeo, Butler University, Eileen Carroll, Butler University, Alexandra Foster, Butler University, Kelly Daneri, Butler University, Isabel Hagedorn, Butler University, Mary H. Andritz-Graham, Butler University, Jane M. Gervasio, Butler University. Since 2008, a free community health screening event has been offered to the Indianapolis community by the College of Pharmacy and Health Sciences. This interprofessional event is organized and hosted by pharmacy and physician assistant students and supervised by clinical pharmacy faculty, pharmacy residents and physician assistant faculty. The student leadership team is selected by the faculty; these students acquire project management experience during the planning, implementation and assessment of the event. The student volunteers’ gain clinical experience and are provided the opportunity to improve their patient counseling skills during the event. Students from all levels of the pharmacy and PA program are able to participate. Students that are beginning their education are paired with students in the P3, P4 and PA2 year to facilitate a peer learning. Formal assessments of student learning that occurs during these events have been conducted through pre- and post-surveys to identify knowledge and skills gained by participating in the event. During the event, the following screenings are offered: complete fasting lipid panel, fasting blood glucose, body mass index, blood pressure assessment, osteoporosis screenings via peripheral ultrasound, and visual acuity. Participants receive results at the event through point-of-care testing and are provided counseling regarding lifestyle strategies to improve their health. Participants with abnormal results determined by national guidelines are referred to follow-up with a primary care provider for further evaluation. The variety of screenings offered provides the students a diverse experience by applying clinical guidelines, and providing health education and medication counseling.

Roosevelt University College of Pharmacy: Living Our Mission. Bud Beatty, Roosevelt University, Melissa Hogan, Roosevelt University. Social justice is the guiding principle for both Roosevelt University and the College of Pharmacy. The central core of the University’s mission states: The hallmarks of the Roosevelt University experience are strong student-faculty interaction and engagement with metropolitan Chicago as both a laboratory for learning and as an expression of its commitment to social justice. The experience is created through the efforts of a strong faculty dedicated to excellence in teaching, research, and creative activity and a staff equally focused on helping students grow and achieve their educational and life goals. The College’s commitment to social justice and serving local and regional communities is exemplified by our outreach efforts. Over the past year students and faculty engaged in service activities that brought support and education to a broad number of underserved and special populations. Though most of the populations served are located within the Chicago metropolitan region, some students and faculty engaged in international outreach. The experience for students was invaluable. It allowed them to work with community members in a meaningful way by providing assistance, support and education that will hopefully improve their health. Faculty benefit from the engagement by providing their skill and expertise, model to students appropriate ways to interact with community member, but most importantly, to observe how well students are able to apply what they have been taught in their classroom and laboratory experiences. This poster will present a sampling of the educational and service activities provided by Roosevelt University students and faculty.

Semper Paratus: Preparing Students to Serve the Campus and Community during a Public Health Emergency. G. Lawrence Hogue, University of Maryland Eastern Shore, Eric C. Barbeye, University of Maryland Eastern Shore. Objective: To inform and engage students and the greater campus community, including the University public safety department and local health departments, regarding the concepts and applications of emergency preparedness and response (EP&R) and to showcase the students’ role in mitigating public health threats to their community. Methods: Students received lectures on EP&R explaining the process of delivering medications and supplies from federal stockpiles to local points of dispensing (PODs) and a
just-in-time training of POD operations relative to a hypothetical terrorist
release of anthrax. Faculty and previously trained students served as
facilitators to guide and monitor drill operations along with the Uni-
versity crisis team and local health departments. Throughout times,
accuracy rates, and after-action reviews were evaluated. Results:
Sixty pharmacy and 40 physician assistant students role-played as
patients and providers. Faculty, student facilitators, campus police,
and health department personnel actively engaged and coached the
students. The exercise achieved a throughput rate of approximately
384 patients/hour. Students and observers provided feedback that the
exercise was valuable and should be continued. After-action reviews
were positive for procedures but identified some areas for improve-
ment. Implications: This innovative drill prepares volunteers for the
EP&R workforce in POD operations during a public health crisis. This
type of drill could be expanded to other professional programs and
used to provide influenza vaccinations to serve the dual purpose of both
training students and providing community service. Trained students
gain a greater awareness of and become more apt to volunteer in
supporting their state and national EP&R programs.

Service-Based APPEs: Innovations in Community Engagement.
C. Lea Bonner, Mercer University, Hewitt W. Matthews, Mercer Uni-
versity, Candace W. Barnett, Mercer University, Susan W. Miller,
Mercer University. Service-learning (SL) is an important component
of experiential education. Student pharmacists at Mercer University
College of Pharmacy (MUCOP) complete required SL during the first
three professional years. In 2009, aligned with the University’s mis-
tion, MUCOP extended SL opportunities into the fourth professional
year by developing a service-based advanced pharmacy practice ex-
pereence (APPE) designed to serve the global community—Global
Medical Missions (GMM). GMM currently occurs on three continents,
may be faith-based, and provides pharmacy services to thousands of
patients each year. In 2012 MUCOP expanded service-based APPEs to
local communities including marginalized populations through the
Healthcare Service (HCS) APPE. HCS sites include sliding-scale fee
clinics, provider-volunteer clinics, and government-funded clinics. To
date, 70 students have completed service-based APPEs (GMM = 54; HCS = 16); 38 service-based APPEs (GMM = 13; HCS = 25) are
assigned for 2014-2015. The patient demographics served in the
community as reported by students include: gender (male = 50%; female = 50%); income level (low-income = 63.7%; middle-
income = 3.3%; indigent = 33%); education (less than high school completion = 68.3%; high school diploma or higher = 31.7%); race/ ethnicity (Caucasian = 20%; African American = 63.3%; Asian = 5%; Hispanic = 11.7%); and age (child/youth = 18.3%; adult = 71.7%; se-
nior adult = 10%). Service-based APPE student pharmacist activities
that serve the community include: patient-assistance program imple-
mentation, patient and provider education, patient counseling, immu-
nizations, prescription dispensing, and formulary management.
Student, preceptor, and community responses have been positive and
the potential for future growth and development of additional
service-based APPEs is evident.

Serving the Underserved: University of Toledo Community Care
Clinic, an Interdisciplinary Approach to Experiential Learning.
Diane M. Cappelletty, The University of Toledo, Daniel L. Israel,
Zachary M. Henz, Julie A. Murphy, The University of Toledo. Rates
of uninsured and underinsured individuals have increased both nation-
ally and locally. Over 52,000 people from Lucas County (Toledo, OH)
are without medical insurance and many others remain underinsured.
In February 2010, the University of Toledo College of Pharmacy and
Pharmaceutical Sciences (UTCPPS) and the UT College of Medicine
founded the UT Community Care Clinic (CCC) with the dual purpose
of delivering quality health care to the underserved and training future
healthcare professionals. The CCC acts as an interprofessional,
student-run organization composed of students from the UT Colleges
of Pharmacy, Medicine, Nursing, and others. The CCC engages
the community through its CommunityCare Free Medical Clinic, the
mobile migrant worker clinic, the Mildred Bayer Clinic for the home-
less, and numerous public health screenings while providing unique,
interprofessional education opportunities. With an on-site pharmacy
and other services, students observe the various roles of each profes-
sion and learn the different facets of holistic healthcare, while patients
get to experience this holistic healthcare. Interprofessional teams of
students use their vocational skills to collaboratively interview, evaluate,
and provide care under the preceptorship of physicians, pharmacists,
and specialists. The UTCPPS is on the forefront of innovation through ex-
periential learning within an interprofessional team, pioneering medical
care for Toledo’s most vulnerable, in the hope of creating a healthier
world population.

Stayin’ Alive: Student Pharmacists Bringing the Life Saving Skills
of CPR to the Community. Kelly C. Rogers, The University of Ten-
ess, Shannon W. Finks, The University of Tennessee, Marie A.
Chisholm-Burns, The University of Tennessee, Stephanie J. Phelps,
The University of Tennessee. Objective: To design an innovative
student-led, community-based, cardiopulmonary resuscitation (CPR)
program. Design: Each year student pharmacists, who are trained by
college faculty as American Heart Association (AHA) basic life sup-
port (BLS) instructors, teach BLS to first and third year pharmacy
students and to pharmacists during the state association meeting. They
also teach Heartsaver® CPR with automated external defibrillator
(AED) to campus employees. Additionally, they developed and de-
levered free Heartsaver® CPR AED events, targeting groups at great-
ness need who often have little resources. For example, organizations
like Porter Leath in Memphis, which helps >10,000 low-income chil-
dren and families, scouts, daycare workers, students, and senior center
residents have been taught Heartsaver® CPR AED. Instructors also
participate in “Make-A-Splash” with LeBonheur Children’s Hospital,
which provides free CPR training to parents while their children learn
to swim. Assessment: In the past 5 years, our student pharmacists have
taught the life saving skills of CPR AED to over 1500 healthcare pro-
fessionals and 2000 residents in our community. Each participant
completes a standardized AHA evaluation that includes questions re-
lated to program content, presenters’ knowledge, and participant’s
confidence in their ability to perform CPR in an emergency. Evalua-
tions have shown that 100% of responders have confidence in their
knowledge and skills and would perform CPR with AED if an emer-
gency arose. Conclusion: Student pharmacists certified as AHA BLS
instructors have been instrumental in advancing the knowledge of the
life-saving skills of CPR within their community and in doing so have
promoted the profession of pharmacy.

Student Perceptions of Inter-Professional Collaboration through
Geriatric Case Training. Ashton E. Beggs, Belmont University, Phi-
lip E. Johnston, Belmont University. Objectives: To assess student
perceptions and observations following an inter-professional geriatric
case training event. Methods: This five-hour experience served as an
opportunity for students to practice inter-professional skills by work-
ing as a team on a geriatric case and developing a patient assessment
and treatment plan. One hundred fifty one students comprised seven-
teen inter-professional teams. Six health disciplines were represented
on each team: pharmacists, physicians, dieticians, physical therapists,
social workers, and nurse practitioners. Faculty experts consulted with
Student Pharmacist Engagement with Communities and Populations in Montana. Jean T. Carter, The University of Montana, Donna G. Beall, The University of Montana, Howard D. Beall, The University of Montana, Sherrill J. Brown, The University of Montana, Gayle A. Hudgins, The University of Montana, Lori J. Morin, The University of Montana, Kendra Procacci, The University of Montana, Lisa Venuti, The University of Montana. In the process of identifying and trying to select an innovative approach to community engagement by student pharmacists at the University of Montana, we were struck by the variety of activities performed by student organizations, service learning groups, and extracurricular options that were aimed at helping a number of populations within the state. This poster will explore the cumulative impact of these many approaches to community engagement. Examples include contributions such as the 300 peanut-butter-and-jelly sandwiches prepared by Kappa Epsilon members for a local homeless shelter; the 24 meals prepared for the Ronald McDonald House residents by Kappa Psi, Kappa Epsilon and APhA/ASP members, and at least 30 pints of blood (equal to 100 transfusions) collected through Rho Chi/Red Cross blood drives. Student groups assisted Native American students and their families through bi-weekly health fairs; helped Medicare enrollees with their review of Part D plans, and participated in an adopt-a-family program for Christmas. Student groups also supported local programs and research (Relay-for-Life, JDRF) through numerous fund-raising events including bake sales, 5K runs, dinner raffles, walkathons, and auctions. Students raised funds to sponsor children who couldn’t afford a summer asthma camp; ten students also volunteered at the camp. Through IPHARM, many students participated in one or more screening events around the state. Through service learning projects, students provided education on inter-professional healthcare teams, improvement in communication and teamwork skills needed for inter-professional team functioning, and an increase in the perceived value of inter-professional teams for quality patient care. Implications: Participating students perceived benefits from the inter-professional team training. Verbal feedback further confirmed survey results, with many students noting improvement in inter-professional relationships, discovery, collaboration, and knowledge. Survey and verbal feedback will be utilized to further improve the geriatric case training event in the future. Geriatric-specific interprofessional training at the student level may augment patient care provided by these students in their future healthcare careers.

Student Pharmacist Interventions during an Interprofessional IPPE in Underserved, Culturally Diverse Community Health Clinics. Andrew S. Bzowyckyj, University of Missouri-Kansas City, Cameron C. Lindsey, University of Missouri-Kansas City, Valerie L. Ruehler, University of Missouri-Kansas City, Maqual R. Graham, University of Missouri-Kansas City, Steven C. Stoner, University of Missouri-Kansas City, Mark T. Sawkin, University of Missouri-Kansas City, Stephanie Schauner, University of Missouri-Kansas City, Susan Kimble, University of Missouri-Kansas City School of Nursing and Health Studies, Heather Gotham, University of Missouri-Kansas City School of Nursing and Health Studies, Margaret Brommelsiek, University of Missouri-Kansas City School of Nursing and Health Studies. Introduction: This project created an interprofessional (IPPE), collaborative practice model at two community-based urban clinics located in a health professional shortage area providing care to an underserved population. The project created an innovative opportunity to place health professional students from the UMKC Schools of Dentistry, Pharmacy, and Nursing and Health Studies into collaborative teams. Methods: Data were acquired regarding students’ attitudes toward and readiness for IPPE. Student pharmacists participated for eight hours weekly and entered data electronically using an online tool to capture clinic name, age, sex, race/ethnicity, number of medical conditions of the patient, type of activity performed, time spent with the patient, medication reconciliation findings, identification of medication related problems, acceptance rate of student recommendations, and cost avoidance. Focus group and self-reflective data were collected from all students and student pharmacists, respectively. Results: Preliminary results suggest that students are coming to the project with high levels of readiness for IPPE. Eight student pharmacists were enrolled and served a total of 290 patients across the two sites. The majority of patients were female (65.5%), in their third decade of life, and of Hispanic, Black or Caucasian descent. There was a broad range of clinical activities conducted including disease state education, medication counseling, drug information inquiry from nurse practitioners, and physical assessment (n=75, 74, 45 and 45 respectively). Conclusion: In addition to facilitating interprofessional education and communication, integrating student pharmacists into a collaborative practice model impacted patient care through medication reconciliation and resolution of medication related problems.

Student Pharmacists Making a Difference in Their Community. Bella Mehta, The Ohio State University, Ruth E. Emptage, The Ohio State University, Jennifer L. Rodis, The Ohio State University, Nicole Kwiek, The Ohio State University, Alexa M. Sevin, Kristin A. Casper, The Ohio State University, Gerald L. Cable, The Ohio State University, Emily Keefer, The Ohio State University, Ken Hale, The Ohio State University. Student pharmacists from The Ohio State University College of Pharmacy (OSU-COP) are actively involved in advancing the health and well-being of citizens of Ohio through multiple outreach and engagement endeavors. Volunteer student pharmacists serve in six Central Ohio free clinics performing medication histories, inventory management, rounding with prescribers, clarifying and dispensing prescriptions as well as medication counseling with credit provided through IPPEs and an elective interprofessional course. Student pharmacists and undergraduates at OSU-COP and across the country engage with the Generation Rx Initiative. Through educational programming, from “Labs for Life” which engages children at the local science museum to presentations in college dorms and senior centers, students raise awareness about medication safety. Professional student organizations serve their community through health education and screenings. Educational topics include heart health, medication assistance, immunizations and medication safety. Screening activities include Medicare Part D plan selection, osteoporosis risk determination, blood glucose and blood pressure measurements. Through OSU-COP’s Partner for Promotion, student pharmacists work with pharmacists to develop clinical programs within community practices to enhance pharmacist-led care. Programs developed include immunization services, medication therapy management, and transitions of care. During the 2012-2013 academic year, approximately 412 students served communities through outreach and engagement. Over 5000 hours of service were provided. In 2012-2013, student-engaged activities created 13 new educational and service
programs. OSU-COP is engaged in ongoing assessment of educational outcomes of outreach. By empowering and engaging communities through student involvement, OSU-COP serves the residents of Ohio and provides vital hands-on learning for students.

**Student Run Interprofessional Community Clinic.** Morgan Anderson, Rosalind Franklin University of Medicine and Science, Melissa Ballak, Rosalind Franklin University of Medicine and Science, Vik-toria Barr, Rosalind Franklin University of Medicine and Science, Jessica Cottreau, Rosalind Franklin University of Medicine and Science, Sarah S. Garber, Rosalind Franklin University of Medicine and Science, Scott D. Hanes, Rosalind Franklin University of Medicine and Science, Abbie Lyden, Rosalind Franklin University of Medicine and Science, Khayati S. Patel, Rosalind Franklin University of Medicine and Science, Ateequr M. Rahman, Rosalind Franklin University of Medicine and Science, Kevin O. Rynn, Rosalind Franklin University of Medicine and Science, Janeen Winnike, Rosalind Franklin University of Medicine and Science. In 2013, Rosalind Franklin University of Medicine and Science students from Pharmacy (COP), Psychology, Podiatry, Physical Therapy and Medicine programs initiated, organized, administrated and continue to develop the student run Interprofessional Community Clinic (ICC). The ICC mission is to provide accessible, quality healthcare for the underserved in a respectful environment in which students, healthcare professionals, patients, and community members learn from one another by working together interprofessionally. The ICC includes 13 administrative committees, most with COP student representatives: Student Scheduling Coordinators, Outreach, Labs, Student Training, Faculty Liaisons, D4D Liaisons, Supplies, Spanish Translators, Referrals, Clinical Manager & Flow Management, Fundraising & Research, Patient Assistance Program and Patient Appointments. Of 221 student participants, 42 are from COP. Eighty-nine patients, ~2/3 female, have been seen. Services offered are annual physical exams in addition to treatment for diabetes, hypertension, women’s health, headaches, and depression. Each patient is assigned an interprofessional team of 2-3 student Patient Advocates for triage and Medication History. An Allied Medicine Specialty team comprising, three students of different professions including one medical student, provides a physical exam assessing medical and present illness history. The Allied Med team presents findings to a group of supervising faculty physicians and pharmacists to develop an Assessment and Treatment Plan. The patient is counseled on the plan and medications before proceeding to specialty appointments accompanied by their Patient Advocate team. Specialty appointments offered include: individual and group mental health therapy, comprehensive medication overview, medication therapy management, foot screenings, and physical therapy.

**The Influence of the Pharmacy Alumni Student Association (PASA) on Alumni Association Membership.** Sam Eberwein, Campbell University, Paige Brown, Campbell University, Leigh Foushee, Campbell University, Wesley D. Rich, Campbell University. **Background:** The Pharmacy Alumni Student Association (PASA) was started in 2010 to facilitate an active relationship between the students and the alumni of Campbell University’s College of Pharmacy and Health Sciences (CPHS). A secondary aim of PASA is to increase and retain alumni engagement through membership in the dues-based CPHS Alumni Association. **Objectives:** The primary objective for this study was to examine the role PASA had among other predicting factors influencing graduates’ decisions to become members of the CPHS Alumni Association. The secondary objective for this study was to determine other factors that predict if a graduate of CPHS will join the Alumni Association. **Methods:** An anonymous online survey powered by Qualtrics® was emailed to graduates of the CPHS pharmacy program and included the classes of 2011, 2012, and 2013. Data were collected on alumni/student involvement, academics, financial aid, and perceptions of the alumni/student experience. Chi-square analyses were utilized to analyze the data. **Results:** Graduates who had been members of PASA were found to be 4.83 times more likely to be members of the CPHS Alumni Association. Other significant factors associated with Alumni Association membership included receiving scholarships, receiving a CPHS sponsored scholarship, making donations, and having positive student experiences. **Implications:** There is a strong association with PASA membership and CPHS Alumni Association membership among recent graduates. Establishing an organization similar to PASA could aid similar institutions in engaging young alumni.

**The Road Less Travelled: Promoting Social Justice in Healthcare.** Shanna K. O’Connor, University of Washington, Don Downing, University of Washington, Nanci L. Murphy, University of Washington, Michaelene Kedzierski, University of Washington, Skye A. McKennon, University of Washington. **Background:** Like many large cities, Seattle, Washington’s population is culturally and economically diverse with considerable healthcare needs. According to a survey conducted by National Conference on Citizenship1 (2013), Seattle is set apart as one of the most charitable cities in the nation. The University of Washington (UW) promotes this attitude and practice to faculty, staff and students through its commitment to social justice. The mission statement of the School of Pharmacy (SOP) specifically outlines service and the promotion of “the health and well-being of regional, national and global populations.” The School demonstrates an embedded culture of social justice as demonstrated in its impact areas. Impact Areas: UW SOP has multiple innovative areas of impact, but the general categories are advocacy, health policy, increased access and enhanced service delivery. A concentrated focus of outreach endeavors is on marginalized and underserved populations. The School partners with campus, local and global communities to optimize limited resources. Assessment: The scope and impact of social justice activities are measured and evaluated as part of the school’s ongoing efforts to attain its Mission’s goals. Scope-focused metrics include types of services offered, community partners, populations served and specific healthcare issues addressed. Impact-focused metrics include number of patients served, level of and motivation for practitioner and student participation, longevity of programs and infrastructure to support program sustainability and expansion.

**The Tumaini Street Children’s Drop-In Center: A Purdue University College of Pharmacy Global Engagement Partnership.** Ellen M. Schellhase, Purdue University, Monica L. Miller, Purdue University, Samuel Kimani, Imran Manji, Moi Teaching and Referral Hospital, Eldoret, Kenya, Rakhi Karwa, Purdue University, Sonak Pastakia. The city of Eldoret, Kenya is home to approximately 3,000 street children. In 2010 the Tumaini Children’s Drop-In Center (TCDIC) opened a day-time drop-in center (including five core programs: outreach, case management, education, healthcare and livelihoods) to address the needs of this growing population. The mission of TCDIC is to improve the lives of street children by empowering them with hope, knowledge, skills, opportunities and resources necessary to find healthy and sustainable alternatives to street life. TCDIC is a community partner of the Purdue University College of Pharmacy (PUCOP) for many student-led engagement projects. Student pharmacists are an essential part of the TCDIC team; they serve as role models for the children, provide health education, expand access to healthcare, and assist with income-generating projects. Since opening, more than
100 student pharmacists have worked with TCDIC. PUCOP students and faculty who do not visit the site in Eldoret are still able to engage through participation in fundraising activities and supporting student participants. The PUCOP Rho Chi chapter has partnered with the center to sell TCDIC handicrafts and sponsor fundraisers. TCDIC has made a major impact on the student participants which was demonstrated when TCDIC was the recipient of the Class of 2012 gift. Assessment strategies include research projects determining the impact of student-led programs and review of student feedback and evaluations. This innovative partnership has expanded the opportunity for PUCOP student pharmacists to participate in global engagement with a focus on public health and underserved populations.

“To Make Man Whole”: Community Engagement at Loma Linda University School of Pharmacy. Kathryn T. Knecht, Loma Linda University, Nancy E. Kawahara, Loma Linda University. Loma Linda University School of Pharmacy is a faith-based institution that is engaged in multiple ways with the nearby city of San Bernardino, a low-income, largely Latino community with significant educational, economic, and health challenges. An unusual feature of the School of Pharmacy is significant involvement by faculty and students in University-sponsored, non-clinical community initiatives including mentoring-tutoring, an after-school music program, and health career pipeline programs both on and off-campus. These programs build bridges with the surrounding community and provide students an opportunity to develop communication and cross-cultural skills and to learn first-hand about an underserved population in a non-healthcare context. The School of Pharmacy also participates in a variety of clinical community initiatives. These initiatives range from an interprofessional night clinic to a new Street Medicine initiative that meets patients where they live. These programs help students better understand the health care needs of San Bernardino residents and at the same time demonstrate to the community that we care. Historically, students have either volunteered or received academic credit for service-related independent-study projects for their participation in community outreach and service activities. However, a new Professional Development course within our curriculum mandates both clinical and nonclinical service commitments each quarter for all students. The Loma Linda University motto is “To Make Man Whole,” indicating an obligation to address more than just health care needs. This is the message we instill in our students, through active engagement in the community, as we prepare them to enter the practice of pharmacy.

University of Illinois at Chicago College of Pharmacy (UIC-COP) Urban Pharmacy Pilot Program. Clara Awe, University of Illinois at Chicago, Jerry L. Bauman, University of Illinois at Chicago, Ronald Koch, University of Illinois at Chicago. Objectives: UIC-COP established the Urban Pharmacy (UPharm) program at its Chicago campus to complement its successful Rural Pharmacy (RPharm) program at its satellite campus in Rockford. Both are designed with the purpose of supplying pharmacists and pharmaceutical care to underserved areas in Illinois, an important part of our mission. The UPharm program was designed as a longitudinal four-year pilot curriculum to take advantage of UIC-COP location and breadth of clinical opportunities to prepare pharmacist-leaders for urban communities. The objectives are to describe the implementation of the pilot and outcomes. Methods: In fall 2011, a cohort of five entering first year pharmacy students expressed interest to the program director in participating in the UPharm program. In addition to taking required courses within the PharmD curriculum, these students enrolled in a series of six supplemental 1 hour seminars tailored to specific issues of importance for future urban pharmacists. Students identified appropriate neighborhoods for study, based on health needs. The two areas selected were West Humboldt Park and Englewood primarily African American and Hispanic neighborhoods. Results: Content analysis on the students’ written reflections and portfolio reports across time, showed that 100% of the students had developed skills in community and policy-making awareness by partnering with community agencies generally involved in health promotion and disease prevention, and 80% felt obligatory for them to return. Implications: The UPharm program will serve as a model to better prepare pharmacy leaders who will serve urban communities and increase pharmacist resources and capacity building for Illinois.

University of Oklahoma College of Pharmacy Outreach to Underserved 8th Graders. Jane E. Wilson, The University of Oklahoma, Melissa S. Medina, The University of Oklahoma. Founded on the concept of serving others, the University of Oklahoma College of Pharmacy has been promoting a culture of service and caring since its inception 120 years ago. College of Pharmacy community engagement manifests in many forms and includes a diverse group of individuals including students, faculty, staff, and citizens and leaders of the community. Some of our most impactful projects are primary and secondary school based initiatives. In 2011, College of Pharmacy students developed and implemented an outreach program to provide monthly programming to approximately thirty 8th grade students. The programming consists of thirty to forty-five minute sessions held at Millwood Arts Academy, a third through eighth grade magnet school that primarily serves African-American students from low-income families. Discussion of health, wellness, ethical, and substance abuse issues are also a component of the programming. Content delivery consists of mini-lectures, interactive learning exercises, and a visit to the OUHSC campus. Approximately five College of Pharmacy student leaders deliver the programming each session resulting in a 1:6 COP student to Millwood student ratio. Millwood students reported that they were very satisfied with the program and that the programming had helped to inform them about what was needed to academically prepare themselves for college and health professions careers. Millwood students are being tracked longitudinally to see if they enter college. Data will be available in 2016.

University of South Florida College of Pharmacy (USF COP) is Bullish on Community Engagement. John M. Allen, University of South Florida, Sheetal P. Dharia, University of South Florida, Carol Fox, University of South Florida, Amy H. Schwartz, University of South Florida. Community engagement is an essential component of the USF COP mission, vision and goals. Although a new COP, great efforts have been undertaken to ensure community benefit. Community engagement has been incorporated into the curriculum, beginning with the PY1 IPPE, in which student teams are assigned to Boys and Girls Clubs, where they provide instruction on safe medication use and healthy living. The students also visit seniors within local assisted living facilities to obtain medication histories and develop communication skills. Within the PY2 Geriatrics course students provide presentations on medication-related topics and perform medication reviews for residents of local senior centers. Student and site feedback for all course-related activities has been positive. Students and faculty have participated in a variety of community service activities (e.g. health fairs) sponsored by the local AHEC office. The AHEC office collates participation efforts across USF Health programs. Students and faculty participate in the BRIDGE Healthcare Clinic, which is a student-run, free clinic. The students have developed services that complement those provided by other disciplines (COM, COPH, DPT and SW), such as medication counseling and recommendations, and
assistance with adherence. The USF COP has participated in interdisciplinary mission trips to Panama, Dominican Republic and Haiti. Additionally, students and faculty interact with high school students as part of the Upward Bound/AHEC program to provide mentorship and exposure to pharmacy opportunities. The USF COP has taken the ‘bull by the horns’ in regards to community engagement, with no intentions of letting go in the future.

**Using Item Analysis and Faculty Review to Increase Reliability of an End-of-Year Exam.** Alejandro Zertuche, University of the Incarnate Word, David F. Maize, University of the Incarnate Word. In 2007, the Feik School of Pharmacy began administering end-of-year examinations to P1, P2, and P3 students. The goal of the Annual Student Assessment and Progression (ASAP) exam is to measure student attainment of the program’s learning outcomes at the end of each year. In 2011, the school combined analytical item analysis with individual faculty review to increase reliability of the ASAP. The objective of the current study was to demonstrate that the reliability of the ASAP exams increased following implementation of this analytical process. The quality of the ASAP questions was plotted based on difficulty and bisserial point. The resulting scatterplot allowed identification of questions requiring faculty review. The quality of each question improved, and subsequently, significantly increased the reliability of the ASAP exams. The coefficient alpha of internal reliability (alpha) was estimated to evaluate the exam-score reliability. The Spearman’s correlation was calculated to determine whether the alpha had statistically increased throughout the years of administration. The P1 alpha of 0.61 in 2007 statistically increased to 0.78 in 2013 (r = 0.786, p < .036). The P2 alpha of 0.73 statistically increased to 0.84 in 2013 (r = 0.829, p = .042). The P3 ASAP alpha showed an upward trend to 0.882 in 2013, but the increase was not statistically significant. As pharmacy schools implement end-of-year examinations to assess student performance in their curricula, it is important to improve reliability of the assessments. This study provides an analytical technique to guide faculty in reviewing questions to ensure the highest reliability for measuring student achievement of learning outcomes.

**Why Can’t We Be Friends: Incorporating Student Nurses into APhA-ASP Operation Diabetes.** Nicholas Leon, Thomas Jefferson University, Brianna Carbo, Kyle Massey, Kenneth O’Donnell, Andrea Lordan, Emily M. Scopelliti, Thomas Jefferson University. Approximately 75% of all student pharmacists at the Thomas Jefferson School of Pharmacy are members of the American Pharmacists Association – Academy of Student Pharmacists (APhA-ASP) which is one of the most active student organizations on campus. Due to the high prevalence of type 2 diabetes (T2DM) in Philadelphia, Jefferson’s APhA-ASP chapter has invested a significant amount of resources into helping to identify those individuals who are undiagnosed or at risk of developing T2DM through APhA-ASP’s Operation Diabetes initiative. To this end, student pharmacist members of Operation Diabetest reached out to student nurses from the Jefferson School of Nursing to collaborate during community outreach events. Over the past year, student nurses have volunteered alongside student pharmacists during three volunteer community-screening events in the Philadelphia area. At these events, student pharmacists conduct T2DM risk assessments, perform diabetic foot examinations, engage the public in games designed to elucidate sugar content in food, perform blood pressure measurements, etc. Student nurses, under the supervision of a faculty preceptor from the School of Nursing, perform glucose finger stick measurements and counsel on the meaning of these results. Over the course of these three events, student pharmacists have interacted with 310 patients and student nurses have conducted 183 finger sticks. Roles during these events were not mutually exclusive with student pharmacists and nurses frequently working in tandem. Student feedback has been so positive that Jefferson’s APhA-ASP chapter has drafted by-law changes to formally incorporate a student nurse member into the Operation Diabetes committee.

**Working Together to Transform Lives through Pharmacist Collaborative Care and Outreach in the Community.** Brigitte L. Sicit, Virginia Commonwealth University, Leticia R. Moczygemma, Virginia Commonwealth University, Sally M. Mayer, Virginia Commonwealth University, Emily P. Peron, Virginia Commonwealth University. The Pharmacist Collaborative Care and Outreach in the Community (PCOC) initiative is comprised of seven academic-community partnerships with independent senior living facilities, underserved clinics and large-scale community outreach programs. PCOC engages faculty, students, and residents with community partners in the greater Richmond area and the global community, through service, teaching, and research to 1) deliver patient-centered, team-based care to underserved groups (i.e., older adults, the uninsured, homeless individuals, and those living in urban and rural areas); and 2) provide outreach programs that focus on prevention, health education, and support services for disadvantaged and isolated communities. Faculty members at each community site are integrated with care teams and serve as the liaison between the school and the community partner to coordinate service, teaching, and research initiatives. Innovative faculty service models and IPPEs, APPEs, service learning, elective courses, and interprofessional learning experiences have been created to meet the patient care needs of the community and to prepare students who take responsibility for providing quality care to culturally, economically, and socially diverse patient populations. Forty-four faculty members, 500+ students, and 30 residents have provided over 20,000 patient care encounters in the Greater Richmond Area and impacted 6000+ patients in remote rural areas. Further, 50+ research projects have been conducted by faculty, PharmD/graduate students, and residents producing 47 poster presentations and 12 publications. Funding for projects has been awarded by the National Institutes of Health, Health Resources and Services Administration, Council for Community Engagement, American College of Clinical Pharmacy, and American Pharmacists Association Foundation.

**2012-2013 NEW INVESTIGATOR AWARD WINNERS**

**BIOLOGICAL SCIENCES**

**Microneedles as a Novel Means to Individualize Drug Delivery in an Aging Population.** Nicole K. Brogden, The University of Iowa, Megan N. Kelchen, The University of Iowa, Grant O. Holdren, The University of Iowa, Matthew J. Farley, The University of Iowa, M. Bridget Zimmerman, The University of Iowa. **Objectives:** This research aimed to characterize the skin response to microneedle treatment in an aging population (>65 years of age), correlating the response with 1) microneedle geometry and 2) treatment site occlusion. **Methods:** A protocol was conducted to develop a technique for monitoring micropore formation in elderly subjects. Impedance measurements were made pre-and-post-microneedle insertion on the upper arm, using two electrode types: one with a dry electrode surface, the other with a gel surface. Either light or direct pressure was applied to hold the electrode onto the microneedle-treated skin. After optimizing the measurement technique, micropore closure rates were evaluated following insertion of 500 or 750µm length microneedles, with or without occlusive patches placed over the skin after microneedle
removal. Results: Impedance dropped significantly following micro-needle insertion in all subjects (p<0.05), confirming micropore formation. The gel electrode/direct pressure condition yielded the lowest variability between measurements: 3.5% and 3.8% coefficient of variation for elderly (n=9) and control subjects (n=5), respectively. Under occluded conditions, mean micropore closure half-life was similar between control and elderly groups following insertion of 500µm microneedles: 25.2±14.0h vs. 16.1±2.4h, respectively. In elderly subjects treated with 750µm microneedles, micropore closure half-life was slightly longer than control subjects: 30.5±6.2h vs 20.6±9.8h (elderly vs. controls, respectively). Implications: These preliminary data suggest that drug delivery windows may be longer for elderly subjects treated with microneedles. The ease of measurements and short timeframe required to characterize micropore closure makes impedance measurement techniques feasible for predicting individual drug delivery timeframes after microneedle treatment.

**Vasoreparative Functions of a Novel ACE2 Activator, diminazene aceturate, in Diabetes.** Yagna Jarajapu, North Dakota State University, Goutham Vasam, North Dakota State University. Objective: Bone marrow-derived stem/progenitor cells (BMPCs) are known to participate in vascular repair and this reparative function is impaired in diabetes. Activation of angiotensin-converting enzyme-2 (ACE2), that produces Ang-(1-7) from Ang II, was shown to be protective in cardiovascular disease. The current study evaluated the effects of diminazene aceturate (DIZE), an ACE2 activator, in diabetic BM dysfunction and vascular repair. Methods: Effects of DIZE in mouse BM ACE2 activity, and on proliferation and migration of BMPCs, lineage-negative cells, were determined. Circulating BMPCs, lineage+ cKit+ Sca-1+ (LSK) cells, were enumerated in control and streptozotocin (STZ)-induced type 1 diabetic mice (T1D) following DIZE treatment (30 mg/Kg, s.c., for three weeks). Ischemic vascular repair was evaluated in hind-limb ischemia (HLI) model by determining restoration of blood flow in the ischemic limb using Laser-Doppler blood flow imaging system. Results: DIZE stimulated ACE2 activity in mouse BM homogenates. In vitro proliferation, and migration to stromal-derived factor-1α, were impaired in BMPCs obtained from T1D mice compared to control, and this dysfunction was reversed by DIZE treatment in vitro. Long-term T1D (duration 20-24 weeks) not short-term (duration <15 weeks), resulted in decreased number of circulating LSK cells compared to control. In vivo treatment with DIZE significantly increased the circulating LSK cells in long-term diabetes. The recovery of blood flow following HLI was significantly reduced in long-term T1D compared to the recovery in control mice. DIZE treatment partially restored the blood flow in T1D however no significant effect was observed in control. Conclusions: These results suggest that ACE2 activation by DIZE is protective in diabetic vascular disease.

**Capsaicin Antagonizes Botulinum Neurotoxin A at the Motor Nerve Terminals.** Baskaran Thyagarajan, University of Wyoming, Charlotte A. Nutt, University of Wyoming, Padmamalii Baskaran, University of Wyoming. Objectives: Botulinum neurotoxin A (BoNT/A) selectively proteolyzes SNAP-25 to inhibit acetylcholine (ACh) release and causes life-threatening neuropaesthesia. BoNT/A is a potent bioweapon for which no antidotes are currently available. The objective of the work was to develop a novel antidote that counteracts the neurotoxin at the motor nerve terminals. Methods: We used mouse model of localized paralysis caused by BoNT/A. We evaluated the prophylactic and therapeutic effects of capsaicin against BoNT/A. We also used in vitro two electrode voltage clamping technique to measure stimulus evoked acetylcholine release in control and BoNT/A (± capsaicin) treated nerve muscle preparations and immunocytochemical technique to analyze the subcellular distribution of proteins that mediate clathrin dependent endocytosis of BoNT/A. Results: Capsaicin, when injected post BoNT/A exposure, significantly accelerated recovery from neuropaesthesia by restoring ACh release and muscle functions. Capsaicin treatment also decreased the total duration of paralysis by 50% and synergistically increased the effects of 3,4 diaminopyridine (blocks K+ channels and prolongs action potential) on ACh release measured by stimulus evoked twitch tension in BoNT/A poisoned nerve muscle preparations. Further, BoNT/A treatment, in vitro, decreased the expression of CaMKII and synapsin 1 (SYN1) and the phosphorylation of SYN1 in cholinergic Neuro 2a cells. Capsaicin treatment, post BoNT/A, reversed this. We hypothesize that at the MNT, capsaicin stimulated Ca2+ influx via TRPV1 triggers exocytosis by restoring ACh release via CaMKII mediated phosphorylation of SYN1. Implications: Our work will contribute for the development of TRPV1 as a novel target for neuroprotection against botulism and for other neurodegenerative diseases.

**Identification of Novel GPCR Targets in HER2+ Breast Cancer.** Meghana V. Trivedi, University of Houston. Objectives: Human epidermal growth factor receptor-2-overexpressing breast cancer (HER2+ BC) is an aggressive tumor with high rates of anti-HER2 drug resistance. Our goal was to identify novel G-protein coupled receptor (GPCR) targets to improve efficacy and overcome anti-HER2 drug resistance. In preliminary studies, we identified GPR110 as a potential drug target in HER2+ BC. Here, we investigated the role of GPR110 in modulating HER2 signaling and anti-HER2 drug efficacy and resistance in HER2+ BC. Methods: Stable GPR110 overexpression was obtained by lentiviral-mediated delivery of GPR110 cDNA. GPR110 gene knockdown was achieved using target-specific siRNAs. Tumorigenic potential was determined by calculating the % of ALDH1+ cells using Aldefluor assay and by evaluating the anchorage-independent cell growth using soft agar assay over 14 days. The influence of GPR110 overexpression on HER signaling pathway was investigated by measuring the levels of phosphorylated (active) and total protein levels of HER1 and HER2 using immunoblotting. Results: Anchorage-independent cell growth was 5-fold higher in GPR110-overexpressing cells compared to control cells. In addition, GPR110-overexpressing cells had a significantly higher % of ALDH1+ population compared to control cells. Conversely, GPR110 knockdown reduced tumorigenic potential selectively in drug resistant SKBR3 cells but not in parental cells. Phosphorylated (but not total) HER1 and HER2 protein levels were significantly higher in GPR110-overexpressing cells compared to control cells. Implications: We show for the first time a pro-tumorigenic role of GPR110 in HER2+ BC. GPR110 is a novel pharmacological target, inhibition of which may improve anti-HER2 drug efficacy and delay anti-HER2 drug resistance.

**CHEMISTRY**

Harnessing the Evolvability of Peptide-Derived Natural Products to Target Oncogenic Transcription Factor FoxM1. Bowers, Albert, University of North Carolina at Chapel Hill. Objective: Transcriptional deregulation plays a critical role in the early development of many cancers. For example, accumulating research has demonstrated that deregulation of forkhead box (Fox) family transcription factors can alter cell fate and promote tumorigenesis, as well as cancer progression. In particular, FoxM1 is garnering significant attention as a potential therapeutic target in cancer. Structurally, however, FoxM1 is a very difficult medicinal target, lacking many of the classical motifs
Characterization of Off-Target Cannabinoid Modulatory Effects of “Atypical” Dopamine Transporter (DAT) Inhibitors. Christopher W. Cunningham, Concordia University Wisconsin, Cecilia J. Hillard, Medical College of Wisconsin, Lili Du, Medical College of Wisconsin. Objectives: Allosteric modulators of the CB1R cannabinoid receptor (CB1R-AMs) represent a novel approach toward treatment of depression, and stress and anxiety disorders that is hypothesized to be free from the typical cannabinoid effects of direct-acting CB1R agonists. Few structural classes of CB1R-AMs have been reported in the literature. The purpose of this study is to evaluate off-target CB1R activity of “non-classical” DAT inhibitors that were previously reported to act as CB1R-AM in an in vitro assay. Method: The ability of GBR 12909, GBR 12935, and JHW 007 to modulate Bmax, Kd, and Emax of CB1R orthosteric agonist (CP55,940) was determined using mouse brain cerebellar membranes. [3H]CP55,940 displacement binding and the [35S]GTPγS functional assay were used to measure binding affinity and efficacy in stimulating GDP/GTP exchange, respectively. Results: GBR 12909 produced dose-dependent enhancement Bmax up to 10 µM. Diffluorinated GBR 12909 and JHW 007, but not defluorinated GBR 12935, decreased [3H]CP55,940 specific binding. None of the compounds assayed were able to enhance CP55,940 efficacy, though JHW 007 diminished activity at approximately 0.01 µM. These results are not consistent with previous reports. Implications: The results produced here demonstrate differential activity of CB1R-AMs as a function of pharmacological assay. Further evaluation is underway to replicate the previous findings, and to evaluate alternate assays of CB1R function.

New Rac1 Inhibitors in Neuroblastoma SH-SY5Y Cells. Eliud Hernández, University of Puerto Rico, Surangani Dharmawardhane, University of Puerto Rico, Zulma Ramos, University of Puerto Rico, Julia I. Medina, University of Puerto Rico, Diana Soto, University of Puerto Rico. Objectives: In 70% of patients, by the time of diagnosis, neuroblastoma has metastasized and is indicative of a poor prognosis. The objective of this study was to design, synthesize and test in vitro the antiproliferative activity of 2-amino-nicotinamide derivatives and test the efficacy as inhibitors of Rac1 activity in SH-SY5Y neuroblastoma cell line. Methods: All compounds were synthesized by reacting 3-amino-9-ethylcarbazole (or primary and secondary amines) with 2-chloronicotinic acid through nucleophilic aromatic substitution and the carboxylic acid intermediate was coupled with primary or secondary aliphatic amines (or with 3-amino-9-ethylcarbazole. All compounds were tested for their growth inhibitory activity against SH-SY5Y neuroblastoma cells via a Sulforhodamine B based protocol assay and the Rac activity was determined using the lysis protocol in the G-LISA Rac1 Activation Assay. Results: Among the twelve compounds synthesized and examined three compounds showed inhibition of cell growth moderately (GI50 = 25.1 to 38.9 µM). The compound EHop-016 showed the highest inhibitory activity with >90% of growth inhibition at 25 µM (GI50 = 11.2 µM). When we tested the effect of EHop-016 on Rac activity of SH-SY5Y neuroblastoma cells we found that at 5 µM and 10 µM of EHop-016 inhibits 50 and 95% activity, respectively. Implications: These data demonstrate that targeting Rac activity on neuroblastoma cells might represent a new venue for the development of new therapeutics that improves the outcomes for neuroblastoma patients. This project will contribute to public health by identification of small molecule inhibitors that can be developed as novel therapeutics for neuroblastoma disease.

EXPERIENTIAL EDUCATION

Creation and Pilot of an Observational Professionalism Assessment Tool for Use in Experiential Education. Rucha S. Bond, The University of New Mexico, Megan E. Thompson, The University of New Mexico, Dana P. Hammer, University of Washington, Kristin K. Janke, University of Minnesota, and Katherine A. Kelley, The Ohio State University. Objectives: (1) to collaborate with faculty from different colleges of pharmacy to create an observational professionalism tool for use in the experiential setting, and (2) to pilot the tool in the experiential setting from June 2013 to May 2014. Methods: This project was executed in three steps: development of the observational professionalism assessment tool, revision through focus groups, and pilot of the tool in the experiential setting. Development of the tool was completed through conference calls with a collaborative faculty team. The collaborative team consisted of faculty with a scholarship background in student professionalism from four institutions across the country. Three focus groups of faculty, preceptors, and students, provided feedback on the draft. Collaborators incorporated focus group feedback into the final version of the tool. The tool was then piloted in the Advanced Pharmacy Practice Experience (APPE) setting. Results: The tool was piloted at three institutions, The University of New Mexico, University of Minnesota, and The Ohio State University. In addition to validation analysis, preceptor feedback on the tool was obtained. Implications: This tool can provide the observational piece of the triangulation of student professionalism data to foster growth and development in the area of professionalism.

Video Based Training to Improve Preceptor Assessment of Student Clinical Skills. Charles Douglas Texas A&M Health Science Center, Ashley Fox, Texas A&M Health Science Center, Amber Bacak, Texas A&M Health Science Center, Joan Everette-Howser, Texas A&M Health Science Center, Cathy Koo, Texas A&M Health Science Center, Heather Miller, Texas A&M Health Science Center, Veronica Nieto, Texas A&M Health Science Center, Lisa Peña, VA Texas Valley Coastal Bend Health Care System2. Objectives: Research indicates health care preceptors find assessment of student clinical performance challenging. This study’s objective is to increase the quality of pharmacy preceptor assessment skills. Towards this objective, a one-hour, on-line, interactive training course was developed. Results were evaluated for: 1) participant inter-rater agreement,
co-encapsulate the pore-forming protein listeriolysin o (LLO) with doxorubicin into pH-sensitive liposomes to facilitate cytosolic localization of the drug. **Methods:** LLO was recombiantly expressed in E. coli and passively co-encapsulated with doxorubicin in PE: CHEMS::2:1 liposomes. Liposomes were characterized by particle size and encapsulation efficiency. A uterine sarcoma cell line (MES-SA) and its doxorubicin-resistant derivative (MES-SA/Dx5) were treated with the liposomes and analyzed for cell death using a ratio-metric fluorescent assay. **Results:** LLO was expressed in E. coli with high yield and purity. The doxorubicin encapsulation efficiency and particle size of the liposomes with and without LLO were statistically indistinguishable. Liposomes containing both LLO and doxorubicin showed a greater, though statistically insignificant, ability to kill the doxorubicin-resistant cell line than the liposomes containing doxorubicin alone. **Implications:** Although these experiments failed to show a significant increase in the efficacy of LLO-containing doxorubicin liposomes, the results will not necessarily apply to other types of cancer cells. Moreover, this study has generated a facile formulation scheme for the coencapsulation of small molecules and macromolecules within liposomes.

**Omega-3 Fatty Acid Conjugated Nanoconstructs for Targeted Delivery of Paclitaxel.** Venkata K. Yellepeddi, Roseman University of Health Sciences, Kyung Mi Kim, Roseman University of Health Sciences, Jayashree Radhakrishnan, Roseman University of Health Sciences. **Objectives:** Paclitaxel (Taxol®) is a natural product extracted from tree *Taxus brevifolia* and is approved for the treatment of various cancers. Despite its clinical success, paclitaxel is associated with drawbacks such as toxicity and lack of oral bioavailability. The objective of this study was to synthesize, characterize and evaluate in vitro efficacy of polymeric (PAMAM-DHA) conjugate of paclitaxel. **Method:** PAMAM G4 was conjugated with docosahexanoic acid (DHA) using HOBt and HBTU. Both PAMAM-DHA and PAMAM G4 were conjugated to paclitaxel using NHS-ester of paclitaxel. The conjugates were purified and characterized using 1H NMR, MALDI-TOF-MS and high-resolution ESI-MS. The in vitro stability of PAMAM-DHA-paclitaxel in human plasma was evaluated using HPLC. The in vitro anticancer efficacy of PAMAM-DHA-paclitaxel was evaluated in various tumor cell lines (MCF-7, NCI-ADR/RES etc.) using WST-8 reagent based cytotoxicity assay. The calculation of IC50 values and statistical evaluation was performed using GraphPad® Prism 6.0 software. **Results:** The 1H-NMR, MALDI-TOF and high-resolution ESI mass spectra confirmed the conjugation of DHA to PAMAM and paclitaxel. The in vitro stability data showed that PAMAM-DHA-paclitaxel conjugate was stable in human plasma for 24 hours. The in vitro cell growth inhibition data showed that the PAMAM-DHA-paclitaxel conjugate was 3 to 4 fold more cytotoxic to multidrug resistant cancer cells when compared to paclitaxel alone. **Implications:** The data suggested that the PAMAM-DHA-paclitaxel conjugate has better anticancer efficacy when compared to PAMAM-paclitaxel and paclitaxel alone. Thus, PAMAM-DHA can be a potential polymeric delivery system for targeted delivery of paclitaxel to various cancers.

**PHARMACEUTICS**

**Thermosensitive Monoglycerides Blend for Local Delivery of Chemotherapeutic Agents.** Abebe E. Mengesha, Drake University, Mallory J. Tough, Drake University, Natalie T. Benson, Drake University. **Objectives:** The purpose of this project was to develop a novel monoglycerides-based thermal sensitive drug delivery system, specifically for local intracavitary chemotherapy. The primary goal is to find an appropriate blend of glyceryl monooleate (GMO) and glyceryl monolaurate (GML) that could provide a biocompatible and physiological nontoxic thermo-responsive matrix that melts at 42 °C initiating drug release and solidifies at 37 °C terminating the release. **Methods:** Lipid matrices containing mixtures of GMO and GML were evaluated for their potential application as magnetically induced thermo-responsive local drug delivery systems using a poorly water-soluble model drug, nifedipine (NIF). Various compositions between 0 – 100 wt% of GMO-GML mixtures were prepared using fusion as well as solvent-evaporation methods. The melting points, heat of fusion of the binary blends and the crystallization behavior were evaluated using differential scanning calorimetry (DSC) and scanning electron microscopy (SEM). **Results:** The DSC results did show temperature dependent phase transition. The effect of NIF (5 wt%) on the phase transition of the GMO-GML (50:50 wt%) matrix was found to be insignificant. The in vitro release of NIF from the matrix was studied at 37 °C and 42 °C. The matrix released only 35% of the loaded drug slowly in 10 days at 37 °C whereas 96% release was obtained at 42 °C. **Implications:** The DSC results as well as the in vitro NIF release profiles from the GMO-GML matrix confirmed the thermo-responsive nature of the matrix that could provide pulsatile drug release ‘on-demand’.

**Listeriolysin O-Liposomes for the Treatment of Drug-Resistant Cancer.** Zachary F. Walls, East Tennessee State University. **Objectives:** Doxorubicin, a potent anti-cancer drug is most commonly administered as a liposomal formulation to minimize toxic side effects. However, its efficacy remains unaltered compared to free doxorubicin, due in part to an altered intracellular pH gradient in many drug-resistant cancer cells that precludes doxorubicin from freely trafficking across the endosomal membrane. The goal of this study is to

**PHARMACY PRACTICE**

**Ethanol Lock Therapy: A Pilot Safety Study in Infants.** Rebecca Chhim, Catherine Crill, Hailey Collier, Sandra Arnold, Massroor Pourcyrous, Bernd Meibohm, and Michael Christensen. The University of Tennessee Health Science Center and Le Bonheur Children’s Hospital, Memphis, Tennessee. **Objectives:** Ethanol lock therapy (ELT) has emerged as an effective method for prevention and
The Prevalence of Polypharmacy (PP) and Potentially Inappropriate Medication (PIM) Use in Senior Adult Oncology (SAO) Patients. Ginah Nightingale, Thomas Jefferson University, Emily Hajjar, Thomas Jefferson University; Kristine Swartz, Thomas Jefferson University Hospital, Jocelyn Andrel-Sendecki, Thomas Jefferson University, Andrew Chapman, Thomas Jefferson University Hospital. Objectives: Excessive and inappropriate medication use in seniors is a significant public health problem linked to cancer-related therapies further escalate its prevalence and complexity. Existing studies are limited by antiquated criteria. Objectives: 1) Identify prevalence of PP and PIM use; 2) Identify characteristics associated with PP and PIM use; 3) Determine the most inclusive PIM criteria. Methods: This retrospective study involved 248 patients (aged ≥ 60 years) referred for a geriatric-oncology assessment in January 2011 through June 2013 (data from physician/pharmacist electronic notes). PP and excessive polypharmacy (EPP) was defined as concurrent use of ≥ 5 and ≥ 10 medications. PIM use was determined by 2012 Beers, the Screening tool of older persons’ potentially inappropriate prescriptions (STOPP) and the Healthcare and data information set (HEDIS) criteria. Results: Mean age was 79.9 years [range 61-98]; 64% women, 74% Caucasian, 87% solid tumor, mean comorbidities, 7.69). Prevalence of PP, EPP and PIM use was 41%, 43% and 52%, respectively. Characteristics associated with PP were PIM use (P < 0.001), increased number of comorbidities (P < 0.001), declined functional status (P < 0.001) and declined ECOG status (P = 0.005). PIM use was associated with PP (P < 0.001) and increased number of comorbidities (P = 0.005). BEERs and STOPP were most inclusive capturing 120 (69%) and 119 (69%) PIMs versus 58 (34%) with HEDIS. Implications: A pharmacist-led medication assessment identified a high prevalence of PP and PIM use. A modified PIM tool that integrates Beers and STOPP and considers cancer diagnosis/prognosis and cancer therapies is needed to identify and prevent PIM use in this population.

SOCIAL AND ADMINISTRATIVE SCIENCES

Cost-Effectiveness of Treatment Choices in a PTSD Doubly Randomized Preference Trial. Quang A. Le, Western University of Health Sciences, Jason N. Doctor, University of Southern California, Lori A Zoellner, University of Washington; Norah C. Feeny, Case Western Reserve University. Objective: Cost-effectiveness of treatment for posttraumatic stress disorder (PTSD) may depend on type of treatment (e.g., pharmacotherapy versus psychotherapy) and patient choice for treatment. We examined the cost-effectiveness of treatment with prolonged exposure therapy (PE) as compared to pharmacotherapy with sertraline (SER), and the overall treatment choice of giving patients an opportunity to choose their treatment (either PE or SER) as opposed to assigning treatment (either PE or SER) to the patients from the U.S. societal perspective. Method: Two hundred patients aged 18 to 65 years with PTSD enrolled in a doubly randomized preference trial. Patients were randomized to receive their treatment of choice (n = 97) or a randomly assigned treatment (n = 103). In the choice arm, patients chose either PE (n = 61) or SER (n = 36). While in the no-choice arm, patients were randomized to either PE (n = 48) or SER (n = 55). The total costs including direct medical costs, direct non-medical costs, and indirect costs were estimated in 2012 U.S. dollars; and total quality-adjusted life year (QALY) was assessed using the EuroQol-5 dimensions (EQ-5D) instrument in 12-month period. Results: Relative to SER, PE was less costly but more effective when treatment was assigned. Independently, giving choice of treatment also yielded lower costs and more clinical benefits over no-choice of treatment. Implications: Giving patients a choice of treatment may prove cost-effective. When choice is not possible, prolonged exposure therapy may provide the most cost-effective option.

Psychiatric Health Services Utilization and Spending among Young Medicare Enrollees. Jingjing Qian, Auburn University, Richard Hansen, Auburn University, Saranrat Wittayanukorn, Auburn University, Grant McGuffey, Auburn University, Juan Gao, Auburn University. Objectives: Medicare beneficiaries <65 are a medically heterogeneous population with relatively high rates of psychiatric and cognitive conditions, yet little research has explored these issues. This study estimated annual trends of and identified factors associated with any psychiatric prescription utilization, psychiatric hospitalization, and total Medicare spending among Medicare beneficiaries <65. Methods: This retrospective cross-sectional study used 2006-2009 Medicare Current Beneficiary Survey data. Annual trends of any psychiatric prescription utilization, psychiatric hospitalization, and total Medicare spending were estimated. Psychiatric prescription captured antidepressants, antipsychotics, stimulants, mood stabilizers, anxiolytics, hypnotics, and antianemic drugs. Psychiatric hospitalization was defined as any inpatient event with a primary admission diagnosis of psychiatric disorders. Repeated person-year data using generalized estimating equations multivariable models were performed to examine the conditional effects of identified factors on outcomes. Cross-sectional weights were used to provide nationally representative results. Results: The annual prevalence of psychiatric prescription utilization increased over years for both beneficiaries <65 and ≥65, with the prevalence for beneficiaries <65 triple those ≥65 (40.1% vs. 14.0% in 2009, respectively). The prevalence of psychiatric hospitalization decreased from 2.6% to 1.9% in 4 years for beneficiaries <65 but increased from 0.2% to 0.3% for those ≥65. The annual mean Medicare spending increased over years for both young and older beneficiaries. Factors associated with psychiatric services utilization and spending among beneficiaries <65 included demographic and socioeconomic factors, health insurance benefits, self-reported health status, and comorbidities. Implications: Practice and policy interventions are warranted to reduce burdens of psychiatric health services utilization and spending for Medicare beneficiaries <65.
2014 AACP INNOVATIONS IN TEACHING COMPETITION - WINNERS

Curricular Integration of Virtual Patients. Neal J. Benedict, University of Pittsburgh. Virtual patients are computer programs that simulate lifelike clinical scenarios in which the learner becomes the health care professional making therapeutic decisions. The virtual patients that I have developed are constructed from an evidence-based design, align with the School’s curricular outcomes, and are validated with CAPE educational outcomes, fulfills ACPE accreditation standards, and meet my personal expectations to provide a high-fidelity, active learning experience to improve clinical decision making, critical thinking, and self-directed learning skills. I have integrated virtual patients into our pharmacy school’s curriculum and have been utilizing them to improve the learning of critical care knowledge and skills for students, trainees and healthcare professionals since 2007. All virtual patients are built from pre-defined learning objectives, and are currently being deployed as either supplements to didactic lecture or as teaching cases meant to build foundational knowledge and skills. Student learning is improved with the virtual patients as indicated by significant improvements from pretests to posttests in multiple studies. Student satisfaction has been high with using the teaching method. Due to these results, I have continued to seek ways to further integrate virtual patients in as many was as possible. These platforms are practical in teaching students enrolled in healthcare related professions, and are effective in teaching today’s scholars who are digital natives, and consequently more acclimated to learning in a technology-enhanced environment.

Use of Video Recorded Clinic Visits to Improve Assessment of Student Pharmacists’ Clinical Interviewing Skills. Dave L. Dixon, Virginia Commonwealth University, Evan M. Sisson, Virginia Commonwealth University, Veronica P. Shuford, Virginia Commonwealth University, Spencer E. Harpe, Midwestern University/Downers Grove. Experiential education plays an important role in the development of student pharmacists by allowing them the opportunity to observe, and participate, in “real world” pharmacy practice. This is especially true in ambulatory care, where students are often allowed opportunities to independently engage patients and provide direct patient care, in conjunction with their preceptor. Yet, it is challenging to strike a balance between ensuring the patient receives appropriate care, while giving the student autonomy and being able to assess student performance. Audio-visual recording technology has been used as an assessment method in other disciplines (e.g., mental health) but less so in the training of student pharmacists, except in simulation exercises. We aimed to use this approach to improve preceptor assessment and student self-assessment during an Ambulatory Care Advanced Pharmacy Practice Experience. With this approach, preceptors video-record student pharmacists during the clinical interview component of a clinic visit and evaluate them, with the student’s, using a rubric. Thus far, students have self-reported significant improvement in various areas of their clinical interviewing skills and have suggested this approach be used for future students. Our future goals include expanding to other practice settings and using it to observe and evaluate pharmacy and medical students during interprofessional clinic visits.

Development of Online Pharmacy Prerequisite Review Tutorials for First-year Pharmacy Students. Brendan Stamper, Pacific University Oregon, Amber V. Behler, Pacific University Oregon, John P. Harrelson, Pacific University Oregon, Ashimi Malhotra, Pacific University Oregon, Sigrid C. Roberts, Pacific University Oregon, Fawzy Elbarbary, Pacific University Oregon, Deepa Rao, Pacific University Oregon, Catherine Marlow, Pacific University Oregon, Reza Karimi, Pacific University Oregon, Leslie L. Devaud, Pacific University Oregon. The development and implementation of online prerequisite review tutorials was designed to provide students the opportunity to both reinforce foundational scientific material that has been shown to promote academic success in pharmacy school and direct attention to key concepts that will foster a sense of student-driven responsibility and accountability for their learning. This innovative and collaborative tutorial provided an integrated, learner-centered environment to first year pharmacy (P1) students refreshing the key concepts covered in prerequisite undergraduate coursework in the following five disciplines: General Biology, Microbiology, Anatomy & Physiology, General Chemistry, and Organic Chemistry. Students were assessed on the first day of each course with a quiz that counted towards 5% of their final grade for the course. Student feedback suggested that students generally thought these online tutorials (1) refreshed their knowledge, (2) prepared them for the course, (3) encouraged self-directed learning, (4) and promoted comprehension of the course content. Additionally, this tool has the potential to predict student performance in the course; thus identifying students who are likely to struggle, and who could benefit from faculty inventions.

INNOVATIONS IN TEACHING AWARD – HONORABLE MENTION

Using Steps and Checklists in Infectious Diseases. Jason M. Cota, University of the Incarnate Word. We implemented a stepwise approach and checklist in an infectious diseases therapeutics course to teach students to be able to identify missing patient information that is important in decision making and to ensure that students would feel more comfortable making drug recommendations to treat infections that may not have been covered with great depth during the 8-week course. Rather than dividing the class schedule by infection type, it was broken into the following four sections according to steps and a checklist: Assessing Patients With Infectious Diseases (Steps 1-3; Checklist 1-8), Selecting Anti-Infective Therapy Using Foundational Concepts (Step 4; Checklist 9-15), Selecting and Dosing Anti-Infective Therapy in a Clinical Setting (Steps 1-6; Checklist 1-27), and Monitoring and Narrowing Anti-Infective Therapy (Steps 4-10; Checklist 9-37). Open-book, open-internet final exam four times throughout the course to periodically assess whether students could correctly use steps for infections not specifically addressed in class. An open-book, open-internet final exam included questions requiring students to correctly use a stepwise approach to recommend treatment for two infections not specifically addressed in class. The average grade on formative assessments was 84% and the average grade on the final summative assessment was 80%. In addition, student preference for the use of steps and checklists increased over time. The use of a stepwise or checklist approach may allow faculty to successfully balance coverage with depth in time-limited courses and enable students to use these approaches in caring for patients.

From Knowledge to Advanced Patient Care: Active Learning Preparation for Pharmacy Practice. Jeannie K. Lee, The University of Arizona, Richard N. Herrier, The University of Arizona, Janet H. Cooley, The University of Arizona. The objectives of this submission are to describe how an innovative capstone course, Advanced Patient Care, was (1) developed using results from stakeholder focus groups, (2) implemented with diverse active learning strategies including Objective Structured Clinical Examinations, and (3) evaluated using pre- and post-course survey of students, followed by a survey of students during their clinical rotations. The innovative capstone course offered a venue for third-year students to apply their knowledge and skills to prepare for patient care. Using the results from key stakeholder focus
groups, Advanced Patient Care course was developed for active learning preparation. During a two-year implementation, a pre- and post-course survey was used to assess the students’ confidence and knowledge in managing commonly-encountered conditions. A follow-up survey measured the impact of the course on students’ performance on rotations. On the pre- and post-course survey, total mean confidence score increased significantly from 54.27 (± 9.19) to 69.04 (± 8.58, p < 0.001) and the total mean knowledge score increased significantly from 6.26 to 6.85 (p < 0.001). Positive impact was found in the follow-up survey, where majority of the students reported having confidence in performing all items on the survey after participating in the Advanced Patient Care course. A successful operation of the innovative capstone course with active learning preparation increased the students’ confidence and knowledge for advanced patient care.

A Novel Pharmacotherapy Capstone Course to Target Both Student Learning and Programmatic Curricular Assessment. Joseph J. Saseen, University of Colorado, Sunny A. Linnebur, University of Colorado, Laura M. Borgelt, University of Colorado, Jennifer M. Trujillo, University of Colorado, Douglas N. Fish, University of Colorado, Scott W. Mueller, University of Colorado. There is a paucity of published literature describing capstone course models in pharmacy education. The 9-credit hour Pharmacotherapy Capstone course at the University of Colorado has been offered for the past 14 years. It is the last course that students are required to complete prior to moving into Advanced Pharmacy Practice Experiences (APPEs). This capstone course holds students accountable for prior learning by reintroducing previous topics in the form of complex and integrated patient cases and other educational sessions. Active learning methodologies are used exclusively within this model and students are expected to actively participate and learn independently, from peers and through self-assessment. Application of knowledge, application of and skills, and critical thinking are expected in this course. This is a novel and innovative course from three aspects. First, the overall course structure is an innovative and comprehensive model that prepares students for the rigor and expectations of APPEs. Secondly, the Pharmacotherapy Capstone course has provided a tool that has been used for programmatic curricular assessment by providing insight on student abilities and has resulted in improvements to preceding courses within the curriculum. Lastly, experience gained within this course has been an impetus for the design of our renewed curriculum.

EXCELLENCE IN ASSESSMENT AWARD WINNERS

Assessing and Documenting Student Learning. Leanne Coyne, California Northstate University, Karen McClendon, California Northstate University, Parto Khansari, California Northstate University, Tiffany Ho, California Northstate University, David Pearson, California Northstate University: California Northstate University College of Pharmacy (CNUCOP) has an inherent culture of assessment that has developed in part through the use of team-based learning (TBL) in every didactic course. This pedagogical delivery system embraces frequent and substantive evaluations of student learning and has inspired a considerable assessment effort at all levels of the institution, from the classroom, to experiential education, and finally, to the evaluation of our mission. In recent years, it has become increasingly evident that accurate assessment of student learning and continuous feedback for both educators and their students is an indispensable tool for enhancing the experience of teaching and learning. At California Northstate University College of Pharmacy (CNUCOP), effective assessment of learning outcomes is integral to provide evidence of learning, improve curricular design, provide students with information on their strengths and weaknesses, and ultimately increase the effectiveness of the pharmacy program. For each individual course, Student learning outcomes (SLOs) are created that reflect what instructors expect students to be able to demonstrate. Summative evaluations of student learning, including but not limited to, exam questions, projects and OSCEs, are mapped to the appropriate SLOs. Each SLO is then assessed with a 4-tier rubric that provides descriptive feedback about student learning. Results of student learning are compiled in the Student Learning Assessment Dashboard which is shared with key stakeholders. These assessments not only provide feedback to students about their individual performance, but also offer a snapshot of the performance of the entire class, allowing continuous improvements to course and program delivery and to student learning. Results of student learning feed into the assessment of the pharmacy program, which ultimately assists in the evaluation and attempts to ensure achievement of CNUCOP’s mission.

Evaluating Professionalism in the Culture and Curriculum of a Pharm.D. Program. Michael J. Fulford, The University of Georgia, Lindsey H. Welch, The University of Georgia. The integration and assessment of professionalism in Pharm.D. programs is a critical challenge facing pharmacy educators today. Emphasis on student pharmacists demonstrating professionalism through an inter-professional lens is evident in the CAPE outcomes and the ACPE standards. The University of Georgia Pharm.D. program engaged in a two-year process evaluating professionalism within its curriculum and culture. Ideally, assessment of professionalism involves simply developing outcomes, coming up with a perfect intervention to achieve the outcomes, evaluating them, telling the world, and celebrating perfection. However, our experience evolved from the less than ideal. Faculty members noticed disintegration in professional behavior. Students noticed this and came to us wanting to do something. Our experience demonstrates how excellence in assessment can evolve and emerge from a realization of disconnections between standards and culture. Responding to real needs identified by students and faculty led to transformations in our culture and curriculum. This experience reminds us that listening to students is vital to the assessment cycle. Students shared their concerns about poor student attitudes towards professionalism and the lack of accountability. These same concerns emerged in committee meetings as part of our assessment cycle. Concerned students worked with a faculty member and the Director of Assessment to administer a professionalism survey to students. Survey data was shared with key administrators, faculty members, and Pharm.D. students. The data offered insight into student perceptions of professionalism. However, it was evident that continued exploration of themes that emerged warranted. The Dean created a Professionalism Task Force and charged the group with conducting a comprehensive review of the College of Pharmacy’s definitions, policies, culture, and evaluation of professionalism. The task force met regularly for a year. The task force developed follow-up surveys, utilized focus groups of the faculty and students, analyzed literature, and sought feedback from other institutions with comparable situations in an effort to be thorough. As a result, the task force developed recommendations for implementing new programs and initiatives around professionalism and the implementation is a college-wide effort led by the Assistant Dean for Strategic and Academic Initiatives. The core recommendations from the task force that are now being implemented into practice include the following: 1. Developed a working definition with an acronym for seven components: RX DAWGS 2. Include this working definition in all syllabi, policies, and handbooks. 3. Build orientation for new students around RX DAWGS 4. Introduce and emphasize RX DAWGS in the recruitment and admissions process 5. Incorporate
RX DAWGS into the expectations of all co-curricular organizations and offer awards 6. Develop training for preceptors around RX DAWGS 7. Develop an Essentials of Pharmacy Practice course that is taught each semester that focuses on small group interaction and simulations related to essential pharmacy skills with an emphasis on professionalism in an inter-professional context. The first 4 recommendations were implemented during the 2013-14 academic year and the last three will be implemented as part of a new curriculum set to launch during the 2015-16 academic year.

A Simple and Effective Programmatic Assessment Process for Continuous Quality Improvement. Lisa Lebovitz, University of Maryland, Richard N. Dalby, University of Maryland. The University of Maryland School of Pharmacy leads pharmacy education, scientific discovery, patient care, and community engagement in the state of Maryland and beyond. Through programmatic assessment, the school seeks to understand curricular effectiveness and peripheral factors that impact the learning environment. Assessment tools include course evaluations, instructor evaluations, and academic performance campus comparisons. Metrics include academic performance between campuses (equivalence expected), course evaluation completion rate (80% expected) and documentation of course evaluation review (100% expected). High benchmarks were intentionally set because continuous quality improvement is best measured by success of students and faculty. Simple graphs enable quick analysis of results. Course evaluation response rates have been between 67% and 78% in the last six semesters. Documentation of faculty review is 100%. Students benchmark their performance against peers by reviewing their class rank, which is emailed to each individual every semester. The school benchmarks graduating class performance on the NAPLEX against peer institutions and longitudinally, as well as between campus cohorts. Faculty can benchmark themselves against other faculty who taught during the given semester by reflecting on their average instructor rating in conjunction with the other ratings on the graph. This process is easily transferable to other schools of pharmacy, regardless of the type of academic records and registration system and online survey tool for course evaluations. At Maryland, main and distance campus students perform equivalently, faculty are actively engaged with the review of their courses and teaching effectiveness, and students are aware that their perspectives are valued.