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## **An Educational Intervention to Improve Pharmacy Student Empathy for Patients on Hemodialysis**

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## MEETING ABSTRACTS

### 118<sup>th</sup> Annual Meeting of the American Association of Colleges of Pharmacy, Nashville, Tennessee, July 15-19, 2017

#### ADMINISTRATIVE SERVICES

##### Completed Research

##### **A Novel Approach to Conduct a Systematic, Integrative and Quantitative Continual Quality Improvement of Curriculum.**

Ajay Sharma, *Chapman University*, Pamela Mercado, *Chapman University*, Siu-Fun Wong, *Chapman University*. **Objectives:** Our School of Pharmacy utilized a multi-dimensional curriculum map to guide for curriculum development using student learning outcomes (SLOs), ACPE 2016 Appendix 1, and cognitive levels. A consistent, school-wide, systematically delivered knowledge-based summative assessment (integrated exams) provides similar categories of individual and cohort student performances. Using data from these 2 platforms, this practice model showcases a systematic, valid, and reliable process to conduct course-specific continual quality improvement (CQI). **Method:** At the completion of the course, all lesson and course objectives were reviewed and updated in the curriculum map. Using the categorization of the electronic examination platform, the 3 aforementioned dimensions of all exam items with cohort performances were matched to the curriculum maps. The course coordinator made the adjustments and provided rationale for change in subsequent course delivery. Adjustments and student performances are assessed longitudinally. **Results:** From the review of objectives, deletion and addition of Appendix 1 (N=20) were 30% and 20%, respectively, and for SLOs (N=17), they were 35% and 58.8%, respectively. Number of mismatched Appendix 1, SLO and cognitive levels to the exam item pool were recorded at 0%, 5%, and 5%, respectively. Curriculum maps and mis-matched exam items were updated for longitudinal evaluations. **Implications:** This data-driven approach of curriculum review allows for a more precise and reliable assessment process which provides high level of confidence to faculty in their decision-making. This process can be repeated annually to allow faculty to conduct consistent and longitudinal data analyses across the organization to produce a reliable program assessment process.

##### **A Novel Competency Based Assessment Scorecard at a New College of Pharmacy: Lessons Learned.**

William Russell Coyle, *University of North Texas System*, Tina K. Machu, *University of North Texas System*, Annesha White, *University of North Texas System*, William C. Lubawy, *University of Kentucky*. **Objectives:** Based on CAPE Domains and the ACPE 2016 Standards, ongoing changes in pharmacy practice and roles for pharmacists require student pharmacists to have a different and enhanced set of competencies. To meet the educational needs of the future pharmacy program, assessment leaders must develop innovative approaches to monitor competencies. The objective of this study was to provide a resource document in the creation of an innovative Assessment Scorecard. **Method:** The College Educational Outcomes/Competency Scorecard was developed to measure the depth and breadth of competency development in PharmD students. A Rubric was developed by the Assessment Committee to determine key embedded assessments within the curriculum to demonstrate student development based on four key performance indicators (initial, developing, developed and proficient) across each of the CAPE outcomes. The four levels utilized were aligned with the College Curricular Competency Map. **Results:** The scorecard rubric

displays threshold scores, averages, and standard deviations from the appropriate competency. Each semester, a copy of the scorecard is sent to each faculty member and student to communicate Cape Domains, outcomes and competencies, map and measure programmatic outcomes, and track competency development. Select educational outcomes are closely monitored for each competency as an indicator for development. **Implications:** Development of an Assessment Scorecard can provide support for quality pharmacy education programs and excellence in the achievement of student learning outcomes. It is anticipated that over time the indicator educational outcomes to be tracked will rotate among those for each competency. A balanced scorecard reflects monitoring of current performance and efforts to improve processes.

##### **A Quantitative Approach to School/College of Pharmacy Peer Selection Using K-Nearest Neighbor Analysis.**

Michael J. Rudolph, *Marshall University*, H. Glenn Anderson, *Marshall University*, Kevin W. Yingling, *Marshall University*. **Objectives:** 1. Develop objective criteria for selection of school/college of pharmacy (S/COP) peers 2. Compile and analyze S/COP data using K Nearest Neighbor (KNN) Analysis 3. Finalize peer list with school's Executive Council (EC). **Method:** EC identified 14 criteria for selection of peer S/COPs. Criteria included university characteristics such as total enrollment, endowment per student, and distance to Marshall and S/COP characteristics including cohort size, number of faculty, and program age. Data were compiled from public databases and analyzed using KNN to determine the 20 closest peers. **Results:** Means for the selection variables for the 20 peers were highly similar to Marshall. As examples, peers had a mean faculty size of 31 (vs. 25 for Marshall), cohort size of 83 (vs. 79), program age of 14 (vs. 4), university enrollment of 5,135 FTE (vs. 11,324), and endowment per student of 14,052 (vs. 9,513). For most variables, peer means exhibited statistically significant differences from non-peer means. EC reviewed the list of 20 peers and narrowed the list to 11 S/COPs by removing institutions that were considerably older (>10 years) than Marshall or had dissimilar university missions (e.g. primarily undergraduate). Marshall's 5 most similar peers were determined to be Charleston, ETSU, Harding, Belmont, and Lipscomb. **Implications:** The methods in this study can be replicated by other S/COPs looking to objectively identify a list of comparable peers. Selection of a valid peer group is important to develop and monitor external benchmarks for the AACCP surveys, faculty-to-student ratios, and program quality indicators such as NAPLEX pass rates.

##### **Analysis of a Unique Self-Study Review Process Utilized in a New College of Pharmacy.**

Annesha White, *University of North Texas System*, Amulya Tatachar, *University of North Texas System*, William C. Lubawy, *University of Kentucky*, Tina K. Machu, *University of North Texas System*, Russell Coyle, *University of North Texas System*, Carol A. Kominski, *University of North Texas System*, Randy Martin, *University of North Texas System*, Sarah Johnson, *University of North Texas System*, Jin Liu, *University of North Texas System*. **Objectives:** As part of the ACPE review of a professional degree program, an in-depth Self Study is required. As a new college of pharmacy the opportunity existed to evaluate a unique self-study process. The objective

was to examine the impact of the review process on the perceptions of faculty, staff, and students. **Method:** Faculty, staff, and students met at a self-study retreat and were assigned to subcommittees to present updates and respond to action items, develop drafts of assigned sections, and review sections that they did not prepare. At the conclusion of the retreat, all subcommittees reviewed and presented their feedback on all sections. Attendees completed a 14-question pre-test and post-test survey (rating scale 0-10) via Qualtrics. Independent t tests were used to compare participants' perceived level of knowledge. IRB approval was obtained. **Results:** A total of 39 faculty, staff, and students completed the survey (64%, 26%, 10%, respectively). Findings revealed a statistically significant increase in perceived knowledge and camaraderie ratings after participation in the retreat activities. Specifically, the average rating on familiarity with the college's programs and operations (pre Mean 6.4, post Mean 7.8), familiarity with ACPE Standards (pre Mean 6.0, post Mean 7.9), and camaraderie (mutual trust and friendship) among people within the college (pre Mean 6.6, post Mean 7.2) increased after participating in the retreat ( $p < 0.05$ ). **Implications:** This study demonstrated a significant increase in participant knowledge and camaraderie after implementing a novel self-study review process. Assessing the self-study process can provide opportunities to promote transparency, quality, and target areas for improvement.

**Assessing Collegiate Climate: Ensuring Success Through Diversity, Equity, and Inclusion.** Oscar W. Garza, *University of Minnesota*, L' Aurelle A. Johnson, *University of Minnesota*. **Objectives:** To assess the College climate among Students, Faculty, and Staff through semi-structured dialogue and listening sessions. **Method:** In 2016, a series of semi-structured small group discussions were conducted to assess whether all members of the College felt welcomed, supported, included, and valued. Faculty and Staff participated during a Collegiate Strategic Planning event, whilst 2nd and 3rd year professional students participated during a required Professional Development course. Each group recorded issues, insights, and ideas. Three twenty minute rounds of conversations occurred, focusing on a particular prompt regarding experiences associated with inclusivity, equity, and diversity; and concluded with suggestions for future action. After each round, participants rotated to different tables to continue sharing/recording individual and collective experiences. At the end of each discussion, recorded experiences and insights were collected, transcribed, and qualitatively analyzed for emergent themes. **Results:** Approximately 50 faculty and staff, and 320 students participated in the respective discussions. Emergent themes across all groups included concern for: lack of diversity among students and faculty/staff; lack of understanding across both collegiate campuses regarding respective uniqueness and strengths; and lack of inclusivity described as preferential treatment among certain groups in the College; and recommended additional opportunities for intentional dialogue of factors impacting collegiate climate. **Implications:** Climate represents a multifaceted reflection and manifestation of inclusivity, equity, and diversity and considerably impacts the recruitment, retention, and success of students, faculty, and staff. Addressing climate must be a part of any effort to improve the quality and extent of the interactions between various groups and individuals within the institution.

**Assessing Pharmacy and University Faculties' Ability to Accurately and Reliably Apply Bloom's Taxonomy.** Adam C. Welch, *East Tennessee State University*, Samuel C. Karpen, *East Tennessee State University*. **Objectives:** To identify faculties' ability to accurately and reliability classify exam questions based on Bloom's Taxonomy. **Method:** In a pilot study, pharmacy faculty were given an

online survey of sample exam questions and asked to assign each question to one of the six "Original" Bloom's Taxonomy classifications. A follow-up survey using similar methods included all university faculty, where they were presented one of three versions of Bloom's. The Original version or two researcher-generated versions. "Version One" where knowledge was collapsed with comprehension, application with analysis, and synthesis with evaluation. "Version Two" kept knowledge, collapsed comprehension with application, and combined the other three. **Results:** Pharmacy faculty obtained 46.0% accuracy and inter-rater reliability of 0.21 (0.60 is acceptable). Knowledge questions were the most accurately categorized. The follow-up study with university faculty had 131 responses (10.9%) and yielded accuracy for the Original version of 60.6% and reliability 0.31. Version One yielded an accuracy and reliability of 67.6% and 0.42, respectively. Version Two yielded accuracy of 77.6% and reliability of 0.43. On Original Bloom's, faculty, especially self-identified experienced Bloom's users, tended to over-estimate their accuracy. A repeated measures ANOVA showed no difference in accuracy of health sciences and non-health sciences faculty. **Implications:** Pharmacy and other faculty may need development to accurately use Bloom's Taxonomy to identify complexity in their exam questions. A three-tiered method where knowledge is its own category, comprehension and application are combined, and analysis, synthesis, and evaluation are combined yields the highest accuracy. Schools of pharmacy may consider collapsing Bloom's in their Exam Soft tagging.

**Assessing the Impact of a Student-to-Student Peer Mentoring Program.** Amber Etzel, *Ohio Northern University*, Kelly M. Shields, *Ohio Northern University*, Saleh S. Alqifari, *Ohio Northern University*, Nicholas Bileck, *Ohio Northern University*. **Objectives:** As a direct entry program, Ohio Northern University (ONU) students face the concurrent challenge of adjusting to college life while also developing professionalism. In order to help with this transition a peer mentorship program was implemented. Our objective is to evaluate the impact of a newly developed student to student peer mentoring program by 1) obtaining benchmark data for this program and 2) assessing whether the experience was helpful to students. **Method:** First year pharmacy students in a direct-entry (0-6) pharmacy program were paired with upper-level students to form peer mentor groups. These groups met consistently throughout the first academic term of enrollment. Using an electronic survey tool, data were collected from 2014 and 2015 participants about career perception, academic success, and student perceived emotional acclimation to program. **Results:** A total of 289 surveys were distributed and 53 usable surveys were returned (18% response rate). Respondents indicated that the peer-to-peer mentor program was beneficial (71%) in their transition to the College of Pharmacy. The majority (72%) described themselves as actively involved in the mentor relationship. Most (57%) were likely or very likely to volunteer as a mentor for future programs. When asked about retention, 31% of participants indicated they had thought about (but did not) change their mind about pursuing a pharmacy degree. **Implications:** This data was used to modify and further develop the student-to-student peer mentoring program. This program may help provide framework for student development in Accreditation Council for Pharmacy Education (ACPE) Standard 4 program areas.

**Assessment of an Academic and Career Advisement Program to Evaluate Program Satisfaction and Services Utilized.** Karl Fiebelkorn, *University at Buffalo*, The State University of New York, Christine Stumm, *University at Buffalo*, The State University of New York, Jaime L. Maerten-Rivera, *University at Buffalo*, The State University of New York, Fred Doloresco, *University at Buffalo*, The State

*University of New York, Jennifer M. Hess, University at Buffalo, The State University of New York.* **Objectives:** A newly developed, multifaceted advisement program was implemented with students in the class of 2019. The program consisted of an informal “Meet Your Advisor Luncheon,” required faculty advisement sessions, an Alumni Ambassador Program, weekly “All School” conferences, and other events and activities. The program was assessed by evaluating participation in activities along with perceptions of the activities, and comparing the results to students in the class of 2018. **Method:** A survey was administered to students in the class of 2018 (n=117) and 2019 (n=114) to evaluate the types of activities utilized, along with perceptions of these activities. In addition, a faculty survey was administered to assess faculty advisor perceptions of the program. **Results:** Students in the class of 2019 were less likely to report receiving no advising (2%) than those in the class of 2018 (19%). In addition, students in the class of 2019 had a higher participation rate in most of the other activities (Dean’s Alumni Ambassador Mentor Program, Pharmacy Career Day, networking events). Most faculty (86%) agreed that advising was rewarding, were aware of the various resources available through the program (83%), and were comfortable helping students identify career interests (94%), fewer (57%) felt that students played an active role when meeting for advisement. **Implications:** A multifaceted approach to advisement, which includes individual faculty advisement, alumni mentoring, networking events, and student tutoring can be successful in increasing the participation in academic and career advisement activities. Both students and faculty were generally satisfied with the program.

#### **Assessment of the Leadership and Excellence and Development (LEAD) Program Through Prospective Student Perceptions.**

Yue Dong, *University of North Carolina at Chapel Hill*, Carla Y. White, *University of North Carolina at Chapel Hill*, Amy Li, *University of North Carolina at Chapel Hill*, Phillip Transou, *University of North Carolina at Chapel Hill*. **Objectives:** In 2009, the Leadership and Excellence and Development (LEAD) Program was established to recruit college and high school students in North Carolina interested in careers in pharmacy. The objective of this study is to assess student perceptions of the Leadership and Excellence and Development (LEAD) program. **Method:** Post-program surveys were administered to all participants and consisted of 13 questions evaluating pharmacy interest and knowledge, program quality, and opportunities for improvement, using a 5-point Likert scale. Data was analyzed in the high school (n=231) and college student (n=128) cohorts for the years 2014 and 2015, using descriptive statistics. **Results:** Overall satisfaction with the program remained in the 95-100% range between the two years and cohorts, with over 80% of all participants expressing an increased interest in pursuing pharmacy. During 2014 and 2015, the percentage of participants reporting the program format to be engaging increased in both high school and college prospective students. The percentage of individuals indicating that they were knowledgeable about opportunities in pharmacy decreased. **Implications:** The LEAD program may be an effective strategy for exposing prospective students to multiple career areas of the pharmacy profession. However, increasing the application-based activities may have contributed to the overall satisfaction, while having fewer presenters may have decreased perceived knowledge about pharmacy.

#### **Branching Out: Can Satellite Campus Students Lead the Way?**

Patrick T. Rocafort, *University of Maryland*, Jill A. Morgan, *University of Maryland*, Lisa Lebovitz, *University of Maryland*, Kacie Whitty, *University of Maryland*, Brandon Keith, *The Johns Hopkins Medical Institutions*. **Objectives:** The objective is to describe the availability of pharmacy

student organizations at schools/colleges of pharmacies with branch campuses. **Method:** Schools with branch campuses were identified on the ACPE website. School websites were reviewed to determine which student organizations are available at main and branch campuses. Phone calls were made as needed to clarify student organization information. **Results:** There are 32 schools of pharmacies that have at least one branch campus [24 have one branch campus, 5 have two branch campuses, 3 have three branch campuses]. Two general types of branch campuses were observed: sequential where all students complete the early part of the PharmD at the main campus and then deploy to branch campuses, and satellites where small cohorts complete their entire PharmD at those campuses. There are slightly more opportunities for student involvement in pharmacy student organizations at main campuses versus branch campuses: average of 11.5 student organizations (range 6-20) at main campuses, average of 10.7 student organizations (range 4-19) at branch campuses. Ten organizations are available at all main and branch campuses: APhA-ASP, PLS, Rho Chi, SSHP, KY, NCPA, Student Government Association, PDC, SNPhA, and CPFI. Despite having similar opportunities, anecdotal feedback was that satellite students are less active in organizations. **Implications:** A student’s involvement in pharmacy student organizations is an important factor in the development of advanced leadership and teamwork skills that assist the transition into a successful, new practitioner’s career. It is important for schools to promote involvement in these organizations on branch campuses.

#### **Building a Culture of Assessment: Sustainment and Next Steps.**

Annesha White, *University of North Texas System*, Carol A. Kominski, *University of North Texas System*, Tina K. Machu, *University of North Texas System*, Russell Coyle, *University of North Texas System*, Amulya Tatachar, *University of North Texas System*, William C. Lubawy, *University of Kentucky*, Randy Martin, *University of North Texas System*, Jin Liu, *University of North Texas System*, Sarah Johnson, *University of North Texas System*. **Objectives:** The ACPE recently revised standards for PharmD education resulting in a greater need for program assessment. Little research discusses pharmacy faculty and staff views on what it truly means to have a culture of assessment. The objective was to (1) explore attitudes that characterize assessment and (2) examine views on assessment strategies among faculty, staff and students. **Method:** All full time faculty and select staff and students at the University of North Texas System College of Pharmacy were invited to complete an anonymous 24 item online survey via Qualtrics. The survey consisted of both Likert scale (1=strongly disagree, 4=strongly agree) and open ended questions. Demographic data were also collected using descriptive statistics. The University’s IRB approved the study. **Results:** A total of 33 faculty, 9 staff, and 4 students completed the survey. The majority of faculty, staff and students agreed that learning outcomes were written clearly (97%, 100%, 100%). There was interest in revealing failed assessment strategies among faculty and staff (85%, 67%) and acknowledging assessment participation (85%, 100%). Both faculty and staff were interested in using dashboards for assessment tasks (64% and 78%). Students clearly understood college goals and learning outcomes and agreed that assessment feedback spurs student growth and learning. The most common assessment related term identified was ‘Evaluation.’ **Implications:** Open ended responses revealed the need to target assessment in support of basic science faculty and protected time for assessment reflection. Future research includes the administration of this survey at another college with the goal of a comparison of findings.

#### **Comparison of Two Procedures Used to Screen PharmD Applicants for Acceptable Oral English Communications Skills.**

Christine Stumm, *University at Buffalo, The State University of New York*, Erin M. Slazak, *University at Buffalo, The State University of New York*, Jennifer M. Roseberg, *University at Buffalo, The State*

*University of New York, Robert G. Wahler, University at Buffalo, The State University of New York.* **Objectives:** During the 2015-2016 admissions cycle, the University at Buffalo School of Pharmacy and Pharmaceutical Sciences (UB SPPS) implemented an oral communication rubric (OCR) to assess oral English proficiency of PharmD applicants. Two separate procedures were used to screen applicants using the OCR: a mock patient counseling activity (PharmSpeak) and an interview with school faculty, staff and/or alumni. Applicants identified by either procedure completed the Oral Proficiency Interview by computer (OPIc); the result of which impacted their admission decision. The objective of this study is to determine if the interviewer-based procedure identified the same students as the PharmSpeak procedure. **Method:** A retrospective review of data from the 2015-2016 UB SPPS admissions cycle was conducted. Applicants were included if they were screened by both PharmSpeak and an interview. **Results:** 346 applicants were screened using both procedures. 28 and 21 applicants were identified by the PharmSpeak and interview procedures, respectively, and 17 applicants were identified independently by both procedures. Of all applicants who completed the OPIc, 5 scored below established technical standards resulting in admission being denied. All 5 were identified by both procedures. The interviewer-based procedure was non-inferior to the PharmSpeak procedure in flagging candidates for further evaluation. **Implications:** All applicants not offered admission due to inadequate English proficiency were independently identified by both screening procedures. Thus, we have inferred that the interviewer-based procedure is sufficient for screening candidates. Use of the interviewer-based procedure alone will reduce candidate stress and result in use of fewer faculty and staff resources.

**Correlation Between Supplemental Instruction and Academic Success in a College of Pharmacy.** Cameron Durlacher, *Oncology Plus*, Jacqueline A Grosser, *University of South Florida*, Heather M.W. Petrelli, *University of South Florida.* **Objectives:** The purpose of this project is to determine: The effectiveness of a Supplemental Instruction (SI) program on academic success in a college of pharmacy. If there is a statistically significant correlation between the number of SI sessions attended and the final Pharmacotherapeutics (PTX) Grade and End of Semester (EOS) GPA. The difference in the PTX grade for students that did and did not attend SI Sessions. **Method:** De-identified data was reviewed from PY2 students (n=91) including the PTX grade and end of semester grade. Quantitative analysis included descriptive statistics, Pearson R Correlation, and Multiple regression analysis through SPSS in relation of attendance of SI sessions. **Results:** Pearson R correlations revealed no significant difference between the number of SI sessions attended with PTX I and cumulative GPA. Additionally, no correlation was identified between those who attended SI instruction and those that did not. **Implications:** SI programs have been widely utilized at the undergraduate level; the current study adds to the scholarly literature to the effectiveness of SI programs in this population. This is the second of a series of studies on the SI program. The first study, a student satisfaction survey, revealed that students who attend SI sessions perceive that it enhances success in the classroom. However, this study has shown no correlation between those that do attend SI sessions and their academic success. Further research is warranted on the role of SI in pharmacy schools.

**Creating Co-Curricular and Interprofessional Activities for Distance Students: Collaborating With the Chaplain Services Office.** Zara Risoldi Cochrane, *Creighton University*, Diane Jorgensen, *Creighton University.* **Objectives:** When students are at satellite campuses or in online environments, it becomes more difficult to engage them in co-curricular and interprofessional activities. Logistical

challenges may include geographic isolation, multiple time zones, and difficulty partnering with other health professions. The purpose of this project was to create co-curricular and interprofessional opportunities for distance students that help fulfill the affective domain-related expectations of ACPE Standards 3 and 4. **Method:** The Distance Education and Chaplain Services Offices developed three programs, delivered longitudinally over the course of a year: 1) An "All School Dinner and Dialogue: Justice in Health Care" event, featuring a keynote speech followed by student-led discussions. Potluck viewing parties were organized at satellite campuses, and online students logged on for a web-based discussion. 2) Online "Wisdom Groups", offering peer discussion and reflection on topics suggested by students. Wisdom Groups are designed to develop a habit of reflection, covering topics such as work-life balance, resilience, and changing self-identity. 3) Chaplains seminars, including live sessions on reflective practice, meditation, and stress management. Activities offered opportunities for pharmacy students to engage interprofessionally, as well as to serve in leadership roles. **Results:** Seventy-four distance students participated. Qualitative analysis of program outcomes revealed the following themes: identifying successful stress management strategies; enhancing peer support and reducing isolation; providing a safe place to explore struggles, changing self-identity, emotional well-being and work life balance. **Implications:** Partnering with chaplains and leveraging online tools are effective ways to engage distance students in activities related to self-awareness, reflective practice, metacognition, and personal development.

**Defining and Measuring the Quality of PharmD Programs: A Delphi Process.** T. Joseph Mattingly II, *University of Maryland*, Frank Romanelli, *University of Kentucky*, Jeff J. Cain, *University of Kentucky*, Lauren S. Schlesselman, *University of Connecticut.* **Objectives:** To reach consensus regarding quality and other associated measurements related to Doctor of Pharmacy degree programs. **Method:** A Delphi process was conducted with an expert panel of pharmacy school deans over the course of 3 rounds using an online survey tool. Panelists were selected to represent a proportional share of public and private schools. Round 1 included an open-response survey regarding panelists' opinions on what were appropriate measures of quality for PharmD programs. In Round 2, participants were asked to rate their level of agreement with categories created by the research team from Round 1 and with the assignment of measures in each category. In Round 3, categories and metrics that achieved assessment were then ranked by the panel and level of agreement with the ranking was assessed using Kendall's coefficient of concordance. **Results:** The final panel included deans from 15 public schools and 17 private schools. Nine quality indicators reached panel consensus (operational, placement, recruitment, scholarship, service, stakeholder feedback, testing, student success, and curriculum). Additionally, a total of 35 specific measurements for all 9 categories were identified and reached consensus. Placement and student success were ranked as the most important indicators of quality with regards to PharmD programs (Kendall's coefficient = 0.22). **Implications:** Defining the construct of quality for PharmD programs and potential metrics to assess each category of the construct provides a valuable first step in measuring and evaluating PharmD educational programs.

**Does Time Management Matter? Assessing Student Time Use in a Doctor of Pharmacy Program.** Jacqueline M. Zeeman, *University of North Carolina at Chapel Hill*, Isabell Kang, *University of North Carolina at Chapel Hill*, Thomas A. Angelo, *University of North Carolina at Chapel Hill.* **Objectives:** To evaluate how pharmacy students spend their time during the first and second year of a doctor of

pharmacy (PharmD) program and assess whether and how students' time use changes throughout the program. **Method:** Students in a redesigned PharmD curriculum at the UNC Eshelman School of Pharmacy participated in a three-part time-use exercise consisting of (1) time-use prediction, (2) time-logging, and (3) time-use reflection during the first and second year of the program. Students predicted time spent on predefined activities including activities of daily life (i.e., sleeping, hygiene, meals), academic activities (i.e., attending class, studying, participating in co-curriculars), and discretionary activities (i.e., exercising, engaging in social activities, viewing media or social media, working for pay). Students completed a weeklong time-log exercise documenting time spent in these areas and utilized individualized time use summary reports to answer reflection questions. **Results:** First year PharmD students (n=138) reported spending 7.8 hours (32.5% of their time) during the weekday on academic activities compared to 12.3 hours (51.3%) on activities of daily life. The remaining 3.9 hours (16.3%) was spent on discretionary activities. During the second year, PharmD students (n=73) reported spending 6.8 hours (28.3%) of their weekday time use on academic activities, 11.7 hours (48.7%) on activities of daily life, and 4.4 hours (18.5%) on discretionary activities. Sixty-one percent of first year students found the exercise useful and 64% reported it motivated them to change their time use. **Implications:** Time-logging interventions can enhance PharmD students' self-awareness of their time use and time management throughout the curriculum.

#### **Effectiveness of Kingdomality for Measuring CAPE Outcomes.**

Robert McGory, *Nova Southeastern University*, Graciela M. Armayor, *Nova Southeastern University*, Barry A. Bleidt, *Nova Southeastern University*. **Objectives:** To determine if Kingdomality profiling can detect student maturation within CAPE Outcome domains. **Method:** Students determined their Kingdomality role at the beginning and end of the P1 year. Students were assigned to teams of balanced roles to collaborate on assignments and reflections involving practice, leadership, professionalism and co-curricular activities. Each role was assigned a number from 1 to 12, similar to a clock face, and correlated to 1 of 4 Kingdomality quadrants based upon the interrelationships of the roles. The number of students profiled into each role and quadrant was calculated. Changes in roles were determined by a change in assigned number. **Results:** 251 students were profiled. The number of students in each category remained relatively constant. White Knight (40%) Dreamer Minstrel (21%) and Shepherd (15%) were most prevalent roles in both testing periods, resulting in a dominant emotional helper quadrant (76%). Roles with leadership or critical thinking qualities were low (Benevolent Ruler 0%, Scientist 0%, Engineer Builder 1%). 145 (58%) students changed their role during the year. 49% of all students changed by a single clock position, 13% changed by 2, 6% changed by 3, 3% changed by 4, 10% changed by 5 and 19% changed by 6. **Implications:** The overall pattern of Kingdomality roles remains constant within the entire population, but individual students evolved their roles. Exposure to professional experiences may change the student's interests, self-values and nature of interactions with others. Kingdomality may detect changes in CAPE Outcomes. Further study is needed.

#### **For a Satellite Campus Student, Is Residency a Foul Ball or a Home Run?**

Patrick T. Rocafort, *University of Maryland*, Jill A. Morgan, *University of Maryland*, Lisa Lebovitz, *University of Maryland*, Kacie Whitty, *University of Maryland*. **Objectives:** To compare leadership opportunities and residency match rates for PharmD graduates from mothership and satellite campuses. **Method:** Schools listed on the ACPE website with branch campuses were classified into two general

models: "sequential" where all PharmD students start on the main campus and finish at a branch campus, and "mothership/ satellite" where one large cohort and smaller cohort(s) complete their entire education at their assigned campus. Administrators were contacted for graduating class size and residency match by campus for the last 2 years. School websites were used to determine the number of student organizations. A Chi-square test was used to analyze the results. **Results:** There are 32 schools of pharmacies that have at least one branch campus [24 have one branch campus, 5 have two branch campuses, 3 have three branch campuses]. Of these, 22 (69%) use the "mothership/ satellite" model. The average match rate at mothership campuses was >35% and <15% at satellite campuses (p<.001). There are slightly more opportunities for student involvement in pharmacy student organizations at main campuses: average of 11.5 student organizations (range 6-20) at main campuses, average of 10.7 student organizations (range 4-19) at branch campuses. Despite having similar opportunities, anecdotal feedback was that satellite students are less active in organizations. **Implications:** ACPE mandates that schools with branch campuses provide comparable educational and extracurricular opportunities, and leadership experiences are emphasized for well-rounded residency applicants. Schools should encourage satellite students to take advantage of leadership opportunities as part of career preparation.

#### **How Much Are They Learning? Modeling Pharmacy Student Content Knowledge Growth on the PCOA.**

Michael J. Rudolph, *Marshall University*, Jaime L. Maerten-Rivera, *University at Buffalo*, *The State University of New York*, Nicole R. Winston, *Marshall University*, Hongwei Yang, *Arizona State University College of Nursing*, Christopher Gillette, *Marshall University*, Brian Train, *Marshall University*. **Objectives:** 1. To determine whether pharmacy student knowledge in the P1 year and rate of growth from the P1-P4 years differed by PCOA content area 2. To interpret patterns in student knowledge growth based upon pharmacy curricula. **Method:** An anonymized national dataset containing results for all students who completed the PCOA from 2011-2015 was obtained from NABP (N=18,279). Scaled scores (range=0-700), were provided for the overall exam and the four content areas. Scores were linked across time for students taking the exam in multiple program years. Data were analyzed using latent growth curve modeling to determine whether students' initial scores and rate of growth differed by content area. A literature review was conducted to identify the timing of content within the typical pharmacy curriculum. This information was used to interpret the results. **Results:** P1 performance on the PCOA differed by content area. Mean P1 scores were 315.8±61.7 for basic biomedical sciences (BBS), 278.4±48.4 for pharmaceutical sciences (PS), 274.3±66.4 for social/behavioral/administrative sciences (SBS), and 250.3±50.5 for clinical sciences (CS). Student growth from the P1-P4 years also differed by content area with the most growth occurring in CS (135 points) and the least in BBS (28 points). The results were consistent with most pharmacy curricula which emphasize BBS during pre-requisites and the P1 year, PS during the P1/P2 years, and CS during the P2/P3 years. **Implications:** Results support the use of PCOA for assessing student performance in most pharmacy curricula. The presented method is recommended for individual programs to evaluate student growth in their curricula.

#### **Identifying Leadership Expectations for All Pharmacy Faculty Members.**

Andrew Traynor, *Concordia University Wisconsin*, Laura M. Borgelt, *University of Colorado*, Tobias Rodriguez, *Academy for Academic Leadership*, Leigh Ann Ross, *The University of Mississippi*, Terry L. Schwinghammer, *West Virginia University*. **Objectives:** 1.) Define faculty leadership. 2.) List the knowledge, skills and personal characteristics of leadership expected of all faculty. **Method:** A Delphi

method utilizing 23 department chairs, with at least five years of experience in their positions, from U.S. Doctor of Pharmacy programs to develop a consensus-based definition for faculty leadership, characteristics of faculty leaders, knowledge, skills and activities of faculty leadership. Three rounds of the Delphi method were utilized starting with a round of open ended responses followed by rounds rating agreement to statements developed in previous rounds. Consensus was set at 80% of participants agreeing or strongly agreeing to statements developed or refined from previous survey rounds. **Results:** The Delphi Process resulted in a definition of faculty leadership as “the process of collaborating with, inspiring and enabling others, regardless of one’s administrative responsibilities, to achieve goals rooted in a shared mission and vision through ethical efforts in teaching, service and scholarship.” This work identified 10 guiding principles for faculty leadership, 4 learning competencies, 20 personal characteristics, 6 skills and 6 expected leadership activities. **Implications:** The statements developed are the product of extensive debate and begin to articulate, with consensus, the importance, relevance and practicality of faculty leadership. The broad approach of these statements still allows for many opportunities and innovation in the areas of faculty development, hiring, evaluation and promotion.

**Impact of a Scholars Camp on Student Interest in the Pharmacy Profession.** Daniel J. Hansen, *South Dakota State University*, Teresa M. Seefeldt, *South Dakota State University*, Brittney A. Meyer, *South Dakota State University*. **Objectives:** To evaluate the impact of a university sponsored five-day summer recruitment camp on student interest in the pharmacy profession. **Method:** The Scholars Camp focused on high-achieving high school students, allowing them to explore different majors at the University and gain an understanding of academic requirements for each of these career paths. Students who selected pharmacy as their first career choice took part in various activities including sterile and non-sterile compounding, vaccination administration to a mannequin, an acid/base experiment, research lab tours and pharmacy shadowing that aimed to build awareness of the different career opportunities within pharmacy and the important role pharmacists play in the healthcare team. Students completed a survey at the end of camp to evaluate the impact of the program (Likert scale, strongly disagree to strongly agree, as well as free response). **Results:** All the students agreed or strongly agreed that they had a better understanding of what a career in pharmacy may look like, and that the different educational sessions helped them see how biology, chemistry, math and communications skills are critical to a pharmacy career. Over 80% of the students stated they were more interested in a pharmacy career now than they were before participating in the camp. Many of the qualitative comments focused on the importance of hands-on activities in improving the overall experience and student engagement. The students enjoyed these activities most. **Implications:** This hands-on approach to introducing the profession had a positive impact on high school student interest in pharmacy.

**Implementing Team-Based Learning (TBL): The Faculty Experience.** Michael H. Nelson, *Regis University*, Simon Tweddell, *University of Bradford*. **Objectives:** Team-based learning (TBL) is a collaborative learning model that shifts classroom time from a teacher-centered to student-centered approach. While many educators value the increased student engagement that results from TBL, the transition from traditional teaching methods to TBL poses distinct challenges to faculty members. The objective of this study was to assess how faculty members have experienced the implementation of TBL at universities located in the United Kingdom. **Method:** Faculty members in the United Kingdom known to have implemented

TBL in at least one course were identified and invited to participate. Twenty-six faculty members from five universities agreed to participate. Using a semi-structured format, each participant was interviewed in person and recorded. Interview transcripts were inductively analyzed and coded (open and simultaneous coding) using NVivo. **Results:** Eight themes related to the faculty experience of implementing TBL were identified through thematic analysis: 1) importance of experiential learning, 2) TBL has a steep learning curve that is easy to underestimate, 3) a variety of resources are helpful for preparing faculty, 4) additional infrastructure resources are needed, 5) team application exercises are a distinct challenge, 6) quality assurance policies may impeded TBL, 7) program-wide TBL has distinct challenges, and 8) TBL enhances student engagement. **Implications:** Several recommendations emerged from the themes in the areas of supporting and training faculty members for TBL, institutional policies that may create barriers to TBL implementation, and issues related to implementing TBL across an academic program. These recommendations may assist administrators who support faculty members in the process of implementing TBL.

**Introducing Relative Weights Analysis (RWA) as a Useful Tool for Assessment.** Samuel C. Karpen, *East Tennessee State University*, Steve C. Ellis, *East Tennessee State University*. **Objectives:** To introduce RWA as a superior alternative to  $\beta$  comparison for evaluating the importance of individual predictors in regression models. **Method:** We exported P1 GPA, didactic grades, NAPLEX scores, and three years of WedAdmit data to R for analysis. **Results:** Pre-pharmacy GPA, composite PCAT, average pharm-sci grades, and average pharm-practice grades all significantly predicted NAPLEX scores ( $p < .05$ ) and were all moderately correlated. Pharm-practice’s  $\beta$  was 39 times greater than pharm-science’s  $\beta$ , despite a moderate difference in their correlations with NAPLEX scores (.630 vs .435). Reflecting the moderate difference in correlations, RWA indicated that pharm-practice was only four times more important than pharm-sci when predicting NAPLEX scores. Beta comparison over-estimated pharm-practice’s importance because it incorrectly ignored the correlations between the predictors. RWA, however, did take correlations into account and yielded a more accurate estimate of pharm-sci’s importance. In a second analysis, reading PCAT, chemistry PCAT, biology PCAT, and pre-pharmacy math/science GPA were all significantly related to P1 GPA according to their individual t-tests for  $\beta$ . RWA, which did not incorrectly treat the predictors as uncorrelated, indicated the reading PCAT was not a significant predictor of P1 GPA. **Implications:** Regression is prevalent in assessment, and published papers have used  $\beta$  to compare variable importance, and t-tests for  $\beta$  to determine significance. Our research, simulation studies, and applied studies in quantitative/social psychology have demonstrated that relying on  $\beta$  can lead to erroneous conclusions because  $\beta$  incorrectly treats correlated predictors as independent.

**Non-Terminal Degree Offerings in US Pharmacy Programs.** Kylie F. Josefiak, *Western New England University*, Erika L. Vuernick, *Western New England University*, Joshua J. Spooner, *Western New England University*, Daniel R. Kennedy, *Western New England University*. **Objectives:** The goal of this study was to determine the frequency and types of non-terminal degree offerings at United States pharmacy programs. **Method:** Websites of the 136 ACPE accredited pharmacy programs were examined for degree offerings in November and December 2016. Degree offerings were separated into B.S. programs and non-terminal M.S. degrees, and explored for variations based upon class size, institution type (public or private), and length of time since enrolling their first Pharm.D class. **Results:** Thirty



programs do not offer any additional degree programs, which were most commonly four year private programs (73.3%) and had class sizes of less than 100 students (70.0%). Twenty-three programs offer a bachelor's degree; seventeen of which were standalone B.S. programs, 5 were restricted availability "pass through" bachelor's degree to students within the Pharm.D. program that was not generally available to other students, and 1 program offered bachelor's degrees using both pathways. Of these, 12 (52%) offered a BS in Pharmaceutical Science degree and many unique degree options existed, including Global Healthcare Management, Cosmetic Science and Formulation Design or Clinical Research. Research-based and administrative-based master's degrees were offered by 55 (40.4%) and 26 (19.1%) programs respectively. Finally, 66 programs offered a dual degree program where students could earn an additional degree, often an MBA (53 programs) or MPH (24 programs), from another College within the University. **Implications:** As applications and enrollments for the doctor of pharmacy program enter a challenging phase nationwide, Pharm.D. granting institutions may find this data helpful as they consider adding additional degree programs.

**Optimal and Quantifiable Scoring Methods for Faculty Evaluation.** Jayesh Parmar, *Larkin Health Sciences Institute*, Christiane Chbib, *Larkin Health Sciences Institute*, Sandra Benavides, *Larkin Health Sciences Institute*, Mostafa M. Elgebaly, *Larkin Health Sciences Institute*. **Objectives:** 1. To compare three different evaluation methods in case of a strong evaluation and in case of a weak evaluation. 2. To designate a meaningful rank to each scoring method to decide which one best meets the school needs. 3. To analyze the mathematical weaknesses or bias in each method and use data to better redesign evaluation surveys. **Method:** Three scoring methods of courses and faculty evaluations were compared to determine how they differ as assessment tools. Method one was a binary-percentage score where all positive opinions were compared to the negative opinions in 10%-interval. Method two was a 2-points score where scores of 0-2 were compared with the negative scores below zero in 0.5-intervals. Method three was a 5-points score where scores were looked at in 0.5-intervals. Course evaluations were surveys. Each response was collected as a binary-percentage score i.e. positive and negative responses aggregates. The percentage was transformed into 2- and 5-points scales. We then simulated these three methods in two different scenarios, a strong and a weak evaluation. Performance categories for each interval ranged from needing improvement to exceeding expectation. **Results:** We found that after analyzing the aggregate data using the three methods, the performance category was identical in methods 1 and 3 while method 2 provided a positive scoring benefit for faculty when evaluation was borderline between two categories. **Implications:** Administrators can improve programmatic assessment tools e.g. faculty and course evaluations. By understanding the quantitative differences between scoring methods. Faculty can perceive the evaluation tools as more fair methods.

**Pharmaceutical Industry in a Global Context Elective: Development, Implementation and Outcomes.** Natalia Shcherbakova, *Western New England University*. **Objectives:** To describe development and implementation of a 3-credit elective course offered during the second year of a traditional four-year curriculum. The aim of the course was to: 1) introduce students to broad issues relevant to global pharmaceutical industry that receive cursive or no attention during required PharmD coursework; 2) expose students to an array of pharmaceutical industry careers via guest speaker course component. **Method:** The elective course included in-depth coverage of the following topics: biomarkers versus patient-relevant outcomes as clinical

trial endpoints; contract research enterprise; pharmaceutical patents & exclusivity; approval pathways for generics, authorized generics, biosimilars, and orphan therapeutics; ghost and guest authorship; pharmaceutical marketing and drug adoption; pricing and payers; U.S. and global reimbursement systems for pharmaceuticals. The course invited speakers came from the following roles within pharmaceutical and biotech companies: medical information, scientific communications, product vigilance, product management, competitive intelligence, health economics & outcomes research, medical science & managed care liaisons. **Results:** Previously validated anonymous questionnaire regarding learner experiences with course content, format of delivery, assignments as well as self-reported intentions to pursue pharmaceutical industry summer internships and/or post-graduation fellowships was distributed to two cohorts of learners at the end of course. The response rate was 100% (n=26). Fifty-percent of the students (n=13) reported they intend to apply for pharmaceutical industry summer internships and/or industry fellowships post-graduation. **Implications:** The described elective may be adopted by other pharmacy educators to introduce students to topics focused on pharmaceutical industry and encourage exploration of industry careers earlier in the curriculum.

**Predictors of Academic Difficulty in the Pharmaceutical Calculations Component of a First Year Course.** Agnes A. Feemster, *University of Maryland*, Allison Lardieri, *University of Maryland*, Hyunuk Seung, *University of Maryland*. **Objectives:** To determine if student-specific characteristics predict academic difficulty in the pharmaceutical calculations self-study portion of a first year, skills-based course. **Method:** A retrospective multivariate analysis was performed to compare admissions and demographic variables of students who required course remediation and those who did not over a two year period. Data obtained for evaluation included age, citizenship, gender, race, PCAT subsection scores, pre-pharmacy science and math grade point averages (GPAs), and admission application score. To detect potential predictors that were associated with remediation, t-test and Chi-square were performed. Logistic regression model was used to evaluate potential predictors. Odds ratio (OR) and 95% confidence interval (95% CI) were calculated for measures of association. **Results:** 30% of the 318 students participating in the course remediated calculations during the study period. Pre-pharmacy math GPA, PCAT Reading Comprehension (RC), Quantitative Analysis (QA), and Verbal Ability (VA) scores, remediation of medical terminology, admission application score, and academic year were evaluated as potential predictors. In a multivariate analysis, students with low QA and VA scores were more likely to remediate calculations (OR, 3.17; 95% CI, 1.76-5.71; p<0.001, and OR, 2.11; 95% CI, 1.20-3.69; p<0.01, respectively). **Implications:** Lower scores on the QA and VA subsections of the PCAT predicted remediation of pharmaceutical calculations. Early identification of students at risk for remediating may allow course instructors to intervene and prevent academic difficulty.

**Re-Evaluating Student Course Evaluations: Assessment of Modified Strategies to Improve Response Numbers.** Carolyn J. Friel, *MCPHS University-Worcester/Manchester*, Kevin R. Kearney, *MCPHS University-Worcester/Manchester*, Abir Kanaan, *MCPHS University-Worcester/Manchester*, Matthew Metcalf, *MCPHS University-Worcester/Manchester*, Paul Kaplita, *MCPHS University-Worcester/Manchester*, Lisa Irish, *MCPHS University-Worcester/Manchester*, Carroll-Ann W. Goldsmith, *MCPHS University-Worcester/Manchester*. **Objectives:** To determine if a change in deployment of electronic course evaluations (CoursEval) would increase the number of students completing evaluations. **Method:** In the Summer and Fall 2015 semesters, students evaluated all instructors at the end of the

semester using standard university methods (CourseEval). Based upon student focus group recommendations, changes were made to Summer and Fall 2016 CourseEval deployment: 1) deployment schedule was changed, with one-half of the instructors evaluated at the midpoint of the semester, and one-half at the end; or 2) students were divided into subgroups, and each subgroup was invited to evaluate a subset, rather than all, of their instructors, decreasing the CourseEval load and time burden. Mean numbers of evaluations per instructor were compared using the Student's t-test. **Results:** Of the 27 course sections compared, 12 had significantly fewer and 3 had significantly greater mean numbers of evaluations per instructor in 2016 than in 2015. Though significant differences were seen in mean numbers of evaluations per instructor, these differences in terms of absolute numbers of evaluations per instructor were not meaningful in practice (e.g.,  $5.33 \pm 0.58$  vs.  $3 \pm 0$ ; mean  $\pm$  SD, 2016 vs. 2015). Increased numbers of course evaluations were seen for all courses in 2016. **Implications:** While the overall number of course evaluations completed increased, the number of completed evaluations of individual instructors did not. Decreasing the amount of time that students are asked to devote to completing evaluations was not a sufficient incentive to increase response numbers.

**Relationship Between Repeated Undergraduate Prerequisite Coursework on Success in PharmD Program.** Heather M.W. Petrelli, *University of South Florida*, John Whitehead, *University of South Florida*. **Objectives:** This study investigated the relationship between repeated undergraduate prerequisite coursework and academic/professional success in the PharmD program. **Method:** This study was exempt by IRB as a result of de-identified data used. Several data points from admissions applications and the longitudinal database from the last three classes of students in a southern public college were analyzed. Data included the number of prerequisite courses, times each course was repeated, GPA, course failures, scores on capstone exams and graduate licensing exams, and demographic data. Pearson R correlations and chi-square tests for independence were performed. **Results:** Of the 219 students included in the study, 107 repeated courses, 63 repeated more than one course, and 24 repeated the same course multiple times. Significant positive relationships were identified between students with repeated coursework and age ( $r = .211, p < .01$ ), course failures through the PY3 year ( $r = .159, p < .05$ ), and professionalism interventions ( $r = .213, p < .01$ ). Significant negative relationships were identified between students with repeated coursework and cumulative GPA through PY3 year ( $r = -.214, p < .01$ ), scores on PY2 ( $r = -.213, p < .01$ ) and PY3 ( $r = -.183, p < .01$ ) capstone exams. **Implications:** Results suggest the need for consideration to program development potentially with selection of students by the Admissions Committee and/or development of intervention strategies for students identified prior to matriculation with repeated pre-requisite coursework to support best opportunity for success in the program.

**Review of Practices Regarding Pharmacy Student Organization Formation, Funding, and Programming at U.S. Schools of Pharmacy.** Renee M. DeHart, *Samford University*, Marshall E. Cates, *Samford University*. **Objectives:** Recent ACPE Standards 2016 emphasize co-curricular programming. Programming engagement through student pharmacist organizations (aka "organizations") is foundational to many schools' co-curriculum. Adequate funding, membership engagement, and governance structures are vital factors that in turn help these groups thrive over time. However minimal literature exists depicting funding, governance, and membership engagement for benchmarking purposes. The current study's objective was to examine these parameters at a national level among schools of pharmacy. **Method:** Student affairs personnel (identified through the AACP

Student Services SIG) were emailed a link to an anonymous Qualtrics survey. Survey data comparing programs were analyzed descriptively and via t-test (continuous data) and chi-square (nominal data). **Results:** The survey was completed by 73 schools. The majority (53%) were public institutions. The number of organizations on campus was limited by 39.7% of schools. Regarding formation/funding, 75% published policies for organization formation; 53% published policies for financial support. Regarding the use of an "umbrella" format for governance, 36% indicated using one. Schools averaged 11 organizations per school (range 1-18). They averaged 10.4 chapter meetings/month. Regarding the range of campus presence, 18% and 100% of schools had an ISPOR and APhA-ASP chapter, respectively. The percent of enrolled students on average belonging to a given organization ranged from 2.2% to over 40%. 93% reported that organizations assist in the inculcation of professionalism among student pharmacists. **Implications:** Pharmacy schools are inconsistent in their approach to student organization formation, funding and governance. Moreover, there is wide variability between pharmacy schools in regard to sponsored organizations and level of participation.

**Strengthsfinder 2.0 Themes in Pharmacy Students Completing an Academic Administrative Rotation.** Steven C. Stoner, *University of Missouri-Kansas City*, Valerie L. Ruehler, *University of Missouri-Kansas City*, Maqual R. Graham, *University of Missouri-Kansas City*. **Objectives:** The objective of this study is to identify student strengths that increase the likelihood of students electing to participate in the Academic Administrative rotation. A secondary objective is to identify the most common strengths and link those traits to students who enter post-doctoral training or assume leadership roles upon graduation. **Method:** Subjects were self-selected as the elective Academic Administrative rotation requires an application process where interested students voluntarily complete an application and are selected by blinded reviewers. Students selected were given the option to complete the Strengthsfinder 2.0 survey online and provide their "Top 5" strengths. **Results:** A total of 26 students completed the elective rotation since 2012. Eighteen (69%) have or are entering post-doctoral residency training 3 assumed immediate leadership/supervisory roles in practice. The most commonly reported strengths were Input ( $n = 10$ ), Responsibility ( $n = 10$ ), Achiever ( $n = 9$ ), Communication ( $n = 8$ ), and Harmony ( $n = 8$ ). The least common strengths were Adaptability, Connectedness, and Self-Assurance. Of the "Top 5" strengths, Communication achieved the highest average ranking (2.5). **Implications:** Understanding personal strengths helps individuals and mentors to individualize learning experiences, identify strengths that need further develop, and assist in helping to aid personal and professional growth.

**Team-Based, Case-Based Adult Internal Medicine Elective Improves Confidence and Understanding.** Kathleen J. Pincus, *University of Maryland*, Sandeep Devabhakthuni, *University of Maryland*. **Objectives:** To describe the impact of a team-learning, case-based adult internal medicine (AIM) elective on third-year pharmacy (P3) students self-perceived confidence in tasks required for Advanced Pharmacy Practice Experiences (APPE). **Method:** In fall 2017 a new AIM elective was offered for P3 students. In teams of 5, students worked through an adaptive release patient cases, documented their assessment and treatment recommendations in SOAP note format, and presented their case and disease state. Voluntary, anonymous surveys were administered on the first day of class and the week following completion of the class. Fisher's exact test using SAS version 9.4 was performed to analyze survey data. **Results:** Enrollment was limited to 20 students; 19 students completed the pre-survey and 15 students completed the post-survey. There was no statistically significant

difference in the intention to complete residency or intended career across pre-and post-survey. Of the 8 tasks studied, 6 tasks were significantly improved after post-survey compared with pre-survey. These tasks were: completing required Acute-Care APPE ( $p=.0045$ ), writing SOAP notes ( $p=.0049$ ), applying guidelines for patient management ( $p=.008$ ), developing treatment plan ( $p=.009$ ), developing monitoring plans ( $p=.021$ ), presenting journal club ( $p=.009$ ). No difference was shown in patient interviewing and verbal patient presentation.

**Implications:** Results indicate that students responded positively to the course format and their confidence and self-perceived understanding of common AIM disease states increased. We plan to increase enrollment in this course and implement similar activities in other elective courses.

**The Effect of Undergraduate Exposure and Experience on Choosing to Pursue a Pharmacy Degree.** Erica M. McGovern, *Thomas Jefferson University*, Andrew Stacy, *Thomas Jefferson University*, Elena Schmidt, *Thomas Jefferson University*, Elena M. Umland, *Thomas Jefferson University*. **Objectives:** This study evaluates first year pharmacy students' understanding of the various opportunities in pharmacy as markers of the impact of pre-matriculation experiences including undergraduate pharmacy club membership and pharmacy work experience. It also identifies underlying factors (deterrents and motivators) impacting initial consideration of pursuing a pharmacy degree. **Method:** Thirty-four first-year pharmacy students (73.5% female) from 23 undergraduate programs completed an electronic survey (49.3% response rate) in the spring 2017 semester. The survey assessed undergraduate exposure to the opportunities available with a Pharm. D. degree, acquired through school, work experience, or personal relationships. Survey responses were analyzed using SPSS® for trends and significant correlations. **Results:** Using a 4-point Likert scale (1=completely disagree; 4=completely agree), the mean score was 1.88 for the statement "My undergraduate university provided resources that enhanced my understanding of pharmacy". Nineteen students (55.9%) reported no pharmacy school application guidance from their undergraduate program. Twenty-three students (67.6%) worked in a pharmacy setting; the majority of those students (70%) completely agreed that it enhanced their understanding of pharmacy and 33.3% cited work as the main motivator in the decision to apply to pharmacy school. Only two of 15 pharmacist tasks were identified by all participants. **Implications:** This survey highlights an opportunity for pharmacy recruitment strategies. Increased emphasis on educating potential future pharmacy students via undergraduate clubs and programming needs to occur. Capitalizing on this population of students provides potential to increase interest in pharmacy practice, ultimately increasing the applicant pool and achieving increased enrollment at schools of pharmacy.

**The Presence of Greek Life on the Campuses of US Pharmacy Programs.** Karolina Kwietniak, *Western New England University*, Kylie F. Josefiak, *Western New England University*, Daniel R. Kennedy, *Western New England University*. **Objectives:** To analyze the availability and presence of Greek life on Pharmacy Program campuses. **Method:** The websites of the 128 Pharm.D. programs in the US with full ACPE accreditation as of January 2017 were systematically searched to identify how many Greek organizations were present on each campus. Findings were cross-referenced with the corresponding fraternity and sorority organization websites to confirm accuracy of data. **Results:** Greek life was present in 92.2% (118/128) of pharmacy programs; 98.4% (63/64) of public institutions and 86.0% (55/64) of private institutions. At least two Greek organizations were found in 76.5% (98/128) of programs and the maximum number of Greek

organizations found in an individual program was 7. Private institutions had slightly less Greek organizations on average than public schools (2.06 vs 2.18) and a higher student per Greek life ratio (253 students per organization) than public schools (225 students per organization). The ratio of Greek organizations to total students is lowest (100 students per organization) in programs that average less than 80 students per class. It was basically unchanged for class sizes of 81-120 (101 students per organization), and increased steadily with class sizes of 121-160 (131), 161-200 (169) and >200 (252). **Implications:** Most Doctor of Pharmacy programs do offer the opportunity to get involved with Greek life organizations on their campuses and generally offer at least two organizations. Programs looking to grow or expand the presence of Greek life on their campus will find value in considering this review.

**Using PCOA: Experiences From Two Early Adopter Schools.** Jonathan D. Ference, *Wilkes University*, Adam C. Welch, *East Tennessee State University*. **Objectives:** To describe how two schools use the Pharmacy Curriculum Outcomes Assessment (PCOA). **Method:** School 1 has used PCOA since 2008 and evolved to use it for pre-Advanced Pharmacy Practice Experience (APPE) readiness in a medium stakes environment (i.e. 10% of a P3 lab grade was determined by PCOA scaled-score). School 2 has used PCOA since 2013 in a low stakes environment (i.e. student performance independent of any course grade). Motivation was captured at both schools using a validated survey assessing importance and effort on a 5-point Likert scale immediately after the PCOA. Linear correlations with historical North American Pharmacy Licensure Examination (NAPLEX) scores were used to calculate a threshold PCOA score to trigger remediation. These data represent the collective assessments of 463 P3 students taking the PCOA. **Results:** At School 1,  $PCOA = 1.81(NAPLEX) + 171$  [ $R^2=0.33$ ]. If a minimum passing score is a 75 on the NAPLEX, then the threshold PCOA score was 307. Mean student motivation was 4.19 and 4.21 for importance and effort, respectively. At School 2,  $PCOA = 2.00(NAPLEX) + 187$  [ $R^2=0.43$ ], threshold PCOA score of 337. Mean student motivation was 3.63 and 3.65 for importance and effort, respectively. **Implications:** Any student scoring below the threshold score on the PCOA would trigger remediation. At both schools, remediation involved a meeting with the student's mentor and the development of an individualized plan. A current limitation of this model is that PCOA versus NAPLEX correlations may change with the newer NAPLEX blueprint.

**Yes, OSCEs Really Do Prepare Pharmacy Students for APPEs.** Sandeep Devabhakthuni, *University of Maryland*, Lisa Lebovitz, *University of Maryland*. **Objectives:** To explore whether student performance on OSCE analytical skills and affective domains develop over time, with or without instruction, and identify any admission characteristics as predictors of student success in completing the OSCE and NAPLEX. **Method:** Three classes of University of Maryland School of Pharmacy students enrolled between 2010 and 2015 performed OSCEs in their P1, P2 and P3 years. Standardized patient scores for analytical skills and affective domains were compiled for each cohort. Data collection included admission characteristics (PCAT subtest scores, incoming GPA, prior degree, age, gender, race, citizenship), final PharmD GPA and NAPLEX scores. Data were deidentified and analyzed by the School's Pharmaceutical Research Computing (PRC) center. **Results:** Sample size was 1440 (160 students per class x 3 OSCEs per student in P1, P2 and P3 years). Statistically significant improvement was observed in analytical skills and affective domains over time; a decrease between P1 and P2 years was followed by an increase in P3. Certain admission characteristics were significantly predictive of OSCE analytical performance, including incoming

GPA and PCAT reading comprehension score. Race and entrance year were significantly related to the affective domains outcome. Students with lower incoming GPAs showed greater improvement over time in both analytical skills and affective domains. Comparing the NAPLEX score and P3 analytic OSCE score grouped by whether or not they passed the NAPLEX, the data show no relationship between the two variables. **Implications:** OSCEs are an effective teaching instrument to ensure analytical and affective domain competence in all students in preparation for APPEs.

### Theoretical Models

**A Systematic Process for Implementing Change in the College Organizational Culture.** Grace L. Earl, *University of the Sciences*, James M. Hollands, *University of the Sciences*, Thaddeus P. McGinness, *University of the Sciences*, George E. Downs, *University of the Sciences*, Yardlee S. Kauffman, *University of the Sciences*, Peter J. Harvison, *University of the Sciences*. **Objectives:** The aim of this poster is to describe the process used by the college of pharmacy to evaluate stakeholder input in order to recommend specific initiatives to foster culture change. **Method:** The Denison Organizational Culture Survey® was sent to administrators, faculty and staff in May, 2016. The survey was based on a validated model of organizational performance addressing these areas: Mission, Adaptability, Consistency, and Involvement. The 9-member Culture Action Team (CAT) was composed of faculty (2 Assistant, 2 Associate, 2 Professor) and staff members (n = 3). The committee reviewed the survey results from 87 respondents. **Results:** The committee identified the performance area of Consistency as the best area for immediate impact. Consistency represents the individual and organizational expectations for behavior and standard practices. The CAT aligned the recommendations with the colleges Core Values statements. The members participated in brain-storming sessions and created action plans. They generated solutions to promote 360 degree nominations to recognize faculty and staff who embrace or demonstrate core values. The committee ultimately recommended creating a faculty and staff award for those individuals who embrace collaboration and collegiality. **Implications:** The CAT recommendation fostered improving employee satisfaction by rewarding core values and was aligned with the Consistency component of organizational performance. The committee is creating a college award for a faculty and staff member who fosters core values related to collaboration, collegiality and professionalism.

**Case-Based Co-Curricular Activities with Cross-Cohort Teams Develop Students' Personal and Professional Practice Skills.** Jeremy Hughes, *Pacific University Oregon*, David Fuentes, *Pacific University Oregon*, Ashim Malhotra, *Pacific University Oregon*, Madeline Fry, *Pacific University Oregon*, Edward Saito, *Pacific University Oregon*, Angela Ighodaro, *Pacific University Oregon*. **Objectives:** To develop and implement a series of co-curricular sessions where pharmacy students from different professional cohorts work together on projects aimed to improve both cognitive and affective domains, as well as professional practice skills. **Method:** Development of scheduled co-curricular activities resulted from discussions between the offices for student and academic affairs in response to our program's desire to allow students from different cohorts to learn from, and with, one another. As a new requirement, first and second-year student cohorts would work together to develop their affective domains in a manner that could be documented, assessed, and mapped to CAPE 2013 domains 3 and 4. Pre- and post-assessments aligned with CAPE were developed and analyzed to help map students' exposure to areas in the cognitive and affective domains. **Results:** Seven

bi-weekly co-curricular sessions were designed and implemented during which students reviewed authentic patient cases and worked in teams to answer questions. Cases for each session were selected to reinforce and expand knowledge in areas covered in prior courses, while elements of the patient cases were intended to target specific affective areas such as; entrepreneurialism, cultural sensitivity, and patient advocacy. Pre and post-session assessments showed increases in the core areas related to cognitive-affective skills, and professional practice skills. **Implications:** Required co-curricular activities with case-based learning and cross-cohort teams can be used to demonstrate growth in students' personal and professional development, as well as their approach to patient care. Peer support systems and mentoring relationships are created through integrated activities.

**Characterization of the Pharmacy Chief Resident Position.** Sandeep Devabhakthuni, *University of Maryland*, Kristin Watson, *University of Maryland*. **Objectives:** To characterize the role of the pharmacy chief resident including administrative, leadership, organizational, and communication responsibilities at an academic institution that offers over 10 residency and fellowship programs. **Method:** At University of Maryland, a pharmacy chief resident model was established in 2013 to help residency and fellowship programs by serving in supportive personnel capacity. Each year, there are two 6-month terms (first term defined as July to December and second term defined as January to June). An election process has been developed, and the chief resident is elected by the residency and fellowship class using a simple majority. The elected chief resident is then provided with administrative, leadership, organizational, and communication responsibilities. **Results:** Since establishing the chief resident model in 2013, seven residents served as a pharmacy chief resident. The model was well received by the residents, preceptors, and residency program directors. In addition to organizing and coordinating resident activities, the chief residents also served on the alumni newsletter editorial board, attended residency directors meetings, organized community service project, coordinated interview overview sessions, and served as liaison to solicit feedback and concerns from residency and fellowship class. The chief residents were able to further develop their leadership skills in conflict resolution, interpersonal skills, and personnel management. **Implications:** Assigning a pharmacy chief resident can be beneficial in institutions with numerous residency programs by serving in a supportive personnel capacity. The model was well received and increased the residents' confidence and improved their administrative, leadership, organizational, and communication skills.

**Developing a Data Driven Approach to Exam Administration and Support Using ExamSoft.** George Anagnostou, *University of Maryland*, Lisa Finn, *University of Maryland*, Shannon R. Tucker, *University of Maryland*, Andrew Coop, *University of Maryland*. **Objectives:** The objective of this project was to use analytics to assess and improve examination administration and user support. **Method:** By recording details on support interventions related to exam formatting and creation issues, laptop issues before and during proctored exams, upload and download issues, excused absences, ADA accommodations, and support requests, a central data source was created to analyze areas where support needs were concentrated. Support logs and reports from ExamSoft comprised the main data source for evaluation. A visual representation of exam performance was created using Tableau allowing for easier identification of issues where intervention was critical. **Results:** This data-driven approach resulted in an increased ability to target nuanced technical issues with SofTest that would impede the smooth administration of exams. Anti-virus, system security conflicts,

and operating system compatibility issues emerged as leading causes of technical intervention. This informed the creation of targeted communication, custom support materials, and proactive support consultations to improve the exam experience of students and faculty. **Implications:** This success of this methodology has helped establish exam administration analytics as a proactive measure that can improve exam reliability by reducing the overall issues experienced by exam takers during a scheduled exam.

**Development of a Student-Logged Co-Curricular Transcript to Document and Assess Student Growth in CAPE Outcomes.** Jeremy Hughes, *Pacific University Oregon*, David Fuentes, *Pacific University Oregon*, Anita J. Cleven, *Pacific University Oregon*, Jackson Ross, *Pacific University Oregon*, Laura Trupp, *Pacific University Oregon*, Alvin Leung, *Pacific University Oregon*. **Objectives:** To develop and implement a method of documenting and assessing student participation in co-curricular activities as well as student development in affective domains. **Method:** Development of a co-curricular tracking system was initiated with discussions between student and academic affairs and experiential education faculty. Project aims were to document co-curricular activities in an intentional manner and to assess student development in affective domains throughout progression in the program. Students, faculty advisors, and administration were identified as stakeholders, and desired outcomes were determined for each group. A literature search was done to aid in developing a program definition of co-curriculum and in developing a categorical system of activity types. Platforms, methods of data entry, and responsibility for program management were evaluated. **Results:** A new process was developed and implemented for students to log their participation in co-curricular events. Information is uploaded as part of the student's E-Portfolio which is managed by administration, and accessible to students and faculty advisors for mentorship discussions. The process was implemented simultaneously across cohorts with trainings provided at the end of the semester and during Orientation. Student organizations have begun using this system to track member participation, assess achievements, and for chapter reporting. **Implications:** Student-logged co-curricular transcripts can be used by program administration to assess student growth in CAPE 2013 Domains, and can be used by both student organizations and administration to measure student participation in co-curricular activities.

**Enhancing Interprofessional Collaboration Between Pharmacy and Physician Assistant Students Through Real-World Scenarios.** John E. Begert, *Pacific University Oregon*, Jeremy Hughes, *Pacific University Oregon*, David Fuentes, *Pacific University Oregon*, Brandon Nuziale, *Pacific University Oregon*, Pauline Low, *Pacific University Oregon*, Edward Saito, *Pacific University Oregon*, Joselyn Benabe, *Pacific University Oregon*, Katie Steele, *Pacific University Oregon*, Sage Davis-Risen, *Pacific University Oregon*, Craig Turner, *Pacific University Oregon*, Patrick Boyle, *Pacific University Oregon*, Ryan Chan, *Pacific University Oregon*, Brandy Pestka, *Pacific University Oregon*. **Objectives:** To describe an interprofessional experience between pharmacy and physician assistant students, introducing the importance of collaboration to patient centered care. **Method:** Prior to beginning advanced experiential education, health professions students have limited exposure to interprofessional collaboration. A case-based interprofessional activity was developed to improve awareness between pharmacy and physician assistant students. A pre and post-assessment was used to determine views on collaboration and comfort in assessing patient cases. Goals of the activity were to: 1.) Enhance understanding of commonalities and unique roles of each profession within a healthcare team 2.) Improve student communication and

collaboration in providing patient centered care 3.) Reinforce previously learned therapeutic concepts using an authentic scenario. **Results:** A case featuring cardiovascular and endocrine disorders was developed for 155 students divided into teams with both pharmacy and physician assistant students. Guided questions, lab values, and case information was used by students to develop 1) a list of questions they wanted to ask about the case, and 2) a prioritized list of interventions with treatment plans. Faculty introduced the case at the start of the session, students broke into teams to work through the case, and then reconvened for a debrief highlighting the crucial elements. The post-assessment revealed that students placed a higher value on interprofessional collaboration, and improved confidence in their ability to navigate an authentic scenario. **Implications:** This case-based interprofessional activity allowed faculty and students from the pharmacy and physician assistant studies programs to effectively communicate, learn from one another, and resolve team conflicts.

**Proactive Support for Students With Academic Difficulties Decreases Required Remediation and Improves On-Time Graduation Rates.** Sarah J. Faro, *Pacific University Oregon*, Jeremy Hughes, *Pacific University Oregon*, David Fuentes, *Pacific University Oregon*, Melanie Petilla Foeppel, *Pacific University Oregon*, Jackson Ross, *Pacific University Oregon*. **Objectives:** To restructure academic issue management into a more supportive and proactive process so that at-risk students are identified early and receive consistently high levels of support. **Method:** The Office of Student Affairs (OSA) and the Office of Academics and Assessment (OAA) worked with faculty to identify layers of support and guidance for students with academic difficulties. Indicators for poor performance were identified and a flow-chart was created outlining the management of academic issues. An action plan template was created, and a list of resources was generated to assist faculty advisors and progression committee members in consistently improving students' academic progress. **Results:** A process was implemented to cooperatively manage academic issues between our OAA, OSA, and the Student Progressions Committee (SPC). Escalating levels of intervention are triggered when a student requires exam remediation; involving the faculty advisor, then OAA/OSA, and then the SPC. In 2015, the SPC layer was added, increasing SPC referrals in the Fall Semester from 2 in 2014 to 25 in 2015. Interventions from the OAA/OSA were added in 2016, decreasing the number of students escalating to the SPC level of referral to 1 in the Fall Semester. Information about the new structure was disseminated to faculty and students via the Student Handbook, program updates, and faculty meetings. **Implications:** Proactively managing academic issues in a cooperative manner increases opportunities for programs to intervene with at-risk students in a consistent manner. Proactive management improves academic progress for at-risk students, minimizing required remediation and improving on-time graduation rates.

**Students' Self-Assessment and Self-Categorization of Reflective Journal Writing Entries to CAPE Domains.** Anita J. Cleven, *Pacific University Oregon*, Jeremy Hughes, *Pacific University Oregon*, David Fuentes, *Pacific University Oregon*, Jackson Ross, *Pacific University Oregon*, Rita Parsiani, *Pacific University Oregon*. **Objectives:** To create a sustainable and structured model for Reflective Journal Writing (RJW) wherein students will be able to self-assess, and categorize their entry to CAPE Domains. **Method:** A systematic approach was undertaken to develop a model to document cognitive and affective domains in student RJW. Project aims were to 1) provide students with a greater understanding, relevance, and self-awareness of reflective writing activities 2) allow administrators and faculty to track student responses and assess students' development in CAPE domains.

Stakeholders were identified and desired outcomes were determined for each group. Platforms, methods of data entry, and responsibility for program management were evaluated through literature searches and discussions. **Results:** A new process was developed and implemented for students to self-identify affective domains in RJW. After completing RJW utilizing the PIE-RECAP model, students designate CAPE domains and subdomains 1 through 4 that correspond to their entry. The identified domain is selected from a drop-down menu and assignments are uploaded electronically into the student's E-Portfolio. RJW is managed by administration, with assignments and selected domains accessible to students and faculty for mentorship discussions. This process and other elements of student portfolios were implemented simultaneously across cohorts with trainings provided for students at the end of the semester and during Orientation. **Implications:** Student RJW with self-identification of CAPE Domains can be used by program administration to assess student growth in affective domains relative to students' progression.

## **BIOLOGICAL SCIENCES**

### **Completed Research**

**A 3D Tissue-Engineered Bone Marrow Model for Leukemia Proliferation.** Ryan Soo Hoo, *St. Louis College of Pharmacy*, Pilar de la Puente, *Washington University in St. Louis*, Noha N. Salama, *St. Louis College of Pharmacy*, Abdel Kareem Azab, *Washington University in St. Louis*. **Objectives:** Acute (AML) and chronic myeloid leukemia (CML) are hematological malignancies that remain incurable despite neoplastic treatment. In order to improve prevention of disease progression, there remains a need for more complex in vitro models that mimic the intricate human leukemic microenvironment. A plasma-derived 3D tissue-engineered bone marrow (3DTEBM) model was recently developed to simulate the multiple myeloma pathophysiology. This study aimed to use the novel plasma-derived 3DTEBM models to promote proliferation of leukemic cell lines. **Method:** The 3DTEBM culture cell models were constructed by crosslinking fibrinogen from patient-derived plasma. Proliferation rates of AML (THP, MOLM14, NOMO-1, K052) and CML (K562, Ku812) cell lines were measured over 7 days as fold increase of cell count at day 0 in conventional 2D cultures compared to 3DTEBM with accessory stromal cells (Hs5) using flow cytometry. **Results:** Proliferation of all cell lines in co-culture (with Hs5) in 3DTEBM were superior to 2D cultures. AML and CML cell lines demonstrated range increases in expansion rates of 4.5-to-6 and of 3.25-to-6 fold in 3DTEBM for days 3 and 7, compared to expansion rates of 2-2.4 and 3-4 fold in 2D cultures for days 3 and 7, respectively. **Implications:** With the use of the 3DTEBM model, a more conducive environment is created for leukemia cell proliferation, due to naturally-occurring accessory stromal cells and growth factors. The 3DTEBM model provides a more accurate model for studying myeloid leukemia pathophysiology, serving as a future tool for drug screening and improving patient-specific drug resistance testing.

**Alpha-Santalol Inhibits Migration of Breast Cancer Cells by Targeting  $\beta$ -Catenin Pathway.** Ajay K. Bommareddy, *Wilkes University*, James Steigerwalt, *Wilkes University*, Karryn Crisamore, *Wilkes University*, Sarah Brozena, *Wilkes University*, Terra Landis, *Wilkes University*, Adam VanWert, *Wilkes University*, Chandradhar Dwivedi, *South Dakota State University*. **Objectives:** Investigate the role of  $\beta$ -catenin pathway in Alpha-santalol mediated anticancer properties in human breast cancer cells. **Method:** Wound healing migration assay was performed to investigate the effects of alpha-santalol on migration

of breast cancer cells. Immunoblotting was performed using standard procedures employing LICOR-ODYSSEY infra-red scanner. Immunofluorescence assay was performed to explore the role of alpha-santalol on nuclear localization of  $\beta$ -catenin in MDA-MB 231 breast cancer cells. **Results:** Alpha-Santalol treatment inhibited migration of breast cancer cells and also resulted in downregulation of expression of phospho  $\beta$ -catenin levels. Immunofluorescence assay revealed the inhibition of nuclear localization of  $\beta$ -catenin in MDA-MB 231 cells treated with  $\alpha$ -santalol. **Implications:** Alpha-Santalol mediated inhibition of breast cancer cellular migration may be regulated, in part, through down regulation of  $\beta$  catenin pathway and warrants further studies employing relevant in vivo models.

### **Are Some StrengthsQuest Signature Themes More Common in Health Professions Students in Leadership Roles?**

Sukhwinder Kaur, *Campbell University*, Timothy J. Bloom, *Shenandoah University*. **Objectives:** To determine whether student leaders are more likely to have certain StrengthsQuest Signature Themes than students who do not take leadership positions. **Method:** Students in four health professions programs completed the online StrengthsQuest questionnaire and Signature Themes were collected. Names of students who had previously or were currently in leadership roles for a professional student organization were collected from the Student Affairs office. Frequency of themes in those students was compared to frequency in students who had not taken on leadership roles. **Results:** 299 students were included, with 104 holding leadership roles either currently or previously. The two groups shared 4 of their 5 most frequent themes (Responsibility, Harmony, Learner and Achiever), although the rank order in each group was different. Restorative was also in the 5 most frequent themes for students in leadership roles while Relator was in the top 5 for those not in leadership roles. Analysis using Fisher's exact test showed no statistical difference in theme frequency in the two student populations. **Implications:** There is a high degree of similarity in StrengthsQuest Signature Themes in health professions students who choose to take leadership roles in professional student organizations and those who do not.

(Note: At time of submission, Timothy J. Bloom was affiliated with Campbell University)

### **Assuring APPE Readiness Through Comprehensive Pre-APPE**

**Assessment Plan.** Ligia Westrich, *Fairleigh Dickinson University*, Anastasia M. Rivkin, *Fairleigh Dickinson University*, Lillian Rozaklis, *Fairleigh Dickinson University*. **Objectives:** To evaluate Advanced Pharmacy Practice Experience (APPE) readiness by the end of the didactic curriculum using pre-APPE assessments developed in accordance with pre-APPE domains described in the Accreditation Council for Pharmacy Education's "Guidance for Standards 2016." **Method:** Faculty developed 12 pre-APPE skill- and/or knowledge-based assessments, which were peer-reviewed, approved by the assessment committee and administered to students (n=151) enrolled in classes of 2016 and 2017 during their first 3 professional years. Analytic rubrics were used to determine competency. Multiple attempts were permitted and targeted interventions were provided until every student passed all 12 assessments. Cumulative pass rates and extent of reassessment based on the first attempt scores were calculated. Results were disseminated to aid curricular quality improvement efforts and further enhance the assessment plan. **Results:** By the end of the didactic curriculum, 100% of students demonstrated competency in all pre-APPE domains. All students passed 4 of the 12 assessments on their first attempt. The initial pass rate for the remaining 8 assessments ranged from 49% to 99%. Fifty-eight students (38.4%) demonstrated

competence on each of the 12 assessments on their first attempt. Among the remaining students, 52 (34.4%) needed to retake 2 or more assessments. **Implications:** This approach was effective in making students aware of strengths and weaknesses in skill/knowledge domains required to be successful in APPEs. Assessment data identified students who needed additional instruction on key domains and helped implement targeted interventions throughout the didactic curriculum. This approach ensures that each student meets fundamental skill and knowledge requisites prior to APPE.

**Curcumin With Afatinib Inhibit Proliferation and Invasion, and Induce Apoptosis of Human SaOS2 Osteosarcoma Cells.** Lunawati L. Bennett, *Union University*. **Objectives:** Osteosarcoma is a highly invasive malignant bone cancer that is characterized by pain and bone destruction observed in children and adolescents. Conventional therapeutic are often cause drug-resistance and undesirable side effects or risk of disease relapse. There is a need to find compounds that highly effective to use alone or with antineoplastics. Curcumin, a polyphenol from the *Curcuma longa*, has been shown to have antineoplastic properties by inhibiting proliferation, inducing apoptosis, and preventing metastasis in multiple tumors. This study investigated the effects of curcumin, afatinib alone or in combination in SaOS2 by observing their effects on cell proliferation, apoptosis and invasion. **Method:** SaOS2 cells were treated with various concentrations of curcumin or afatinib alone or in their combination ranging from 0.4  $\mu\text{M}$  to 100  $\mu\text{M}$ . MTT assay, Hoechst33342, H2DCFDA, and Rhodamine123 staining using fluorescent microscope were conducted to determine cell viability, chromatin inducing apoptosis, intracellular generation of ROS, and mitochondrial membrane potential, respectively. Western Blot to detect different signaling protein expressions were conducted to test the hypothesis that curcumin synergistically work with afatinib to effect cell proliferation, apoptosis in osteosarcoma cells. **Results:** This study showed combination of 3  $\mu\text{M}$  afatinib and 30 $\mu\text{M}$  curcumin cause decrease cell proliferation. Intracellular ROS generation in apoptotic cells was associated with change in p53, Bax and Bcl2 proteins. Up-regulation cl. casp 3 and cl. PARP indicated apoptosis effect of both compounds. **Implications:** The results indicated the chemo-enhancing potential of curcumin in combination with low dose of afatinib for treatment of human osteosarcoma.

**Development of an Inducible, Autophagy Deficient Mouse Model of Neurologic Disease.** Grant W. Anderson, *University of Minnesota*, Haim Einat, *Academic College of Tel Aviv-Yafo*, Carl Anderson, *University of Minnesota*. **Objectives:** We have previously demonstrated that repeated administration of autophagy enhancing compounds, including rapamycin, trehalose and nicardipine result in mood stabilizing-like effects and changes in autophagy-related protein levels indicative of enhanced autophagy in mouse brains. The present study was designed to explore the behavioral consequences of a conditional deletion of Atg5, a gene required for autophagy. Based on our previous pharmacological data, we hypothesized that conditional deletion of Atg5 will result in behavioral changes related to affective-like pathology and the development of neurodegenerative disease. **Method:** We created a conditional knockout mouse model by crossing Atg5<sup>flox/flox</sup> mice with a mouse strain carrying Cre recombinase under the control of the CamK2a promoter. Atg5 gene deletion was induced by tamoxifen treatment in 4 week old mice. 14 days and also 9 months after treatment, mice were examined in a battery of behavioral tests related to basic neuromotor measures and affective-like assessments. **Results:** Two weeks after induction, the mutation had no effects on basic neuromotor tests including grip strength, beam walking, rotarod and spontaneous activity. However, mutant mice demonstrated a clear manic-like

behavior in the forced swim test, the tail suspension test and the sweet solution preference test. Conversely, after 9 months deletion of the Atg5 gene resulted in significant impairments in spontaneous activity, grip strength, rotarod, and induced grasping reflex. **Implications:** These results support a relationship between autophagy and both affective and neurological disorders suggesting autophagy enhancement may provide a novel target for the development of mood stabilizing drugs and drugs designed to treat neurodegenerative disease.

**Efficacy and Safety of Cariprazine in the Treatment of Schizophrenia.** Mohammed Alasmari, *MCPHS University–Worcester/Manchester*, Alok Sharma, *MCPHS University–Worcester/Manchester*. **Objectives:** Reviewed the literature to determine: 1. the efficacy of cariprazine to treat schizophrenia by observing the PANSS and CGI-I scales 2. the safety of cariprazine by observing the adverse effects reported in patients 3. the improvement in quality of life by observing a reduction in the SOLS-R4 scores. **Method:** Embase (1974–two weeks of 2017) and Medline (1946–two weeks of 2017) databases were searched via Ovid and PubMed, respectively, using the MeSH terms cariprazine AND schizophrenia. The initial search results (188 in Embase and 52 in PubMed) were limited to randomized controlled trials, which resulted in 23 (17 Embase and 6 Pubmed) articles. Abstracts for all of the 23 articles were reviewed. After excluding articles that were evaluating the efficacy of cariprazine in disorders other than schizophrenia, 7 articles remained that evaluated the efficacy and safety of cariprazine in schizophrenia. These articles were thoroughly reviewed and summarized. **Results:** Superiority of cariprazine over comparators was easily noticed in all studies, with statistical significant changes on PANSS and CGI-I scales. Moreover, quality of life improved dramatically with a statistically significant reduction in SOLS-R4 scores. Adverse events were classified as mild to moderate in all studies. Extrapyramidal symptoms, akathisia, insomnia, tremor, headache, and constipation were the most common adverse events associated with cariprazine. **Implications:** Cariprazine is effective in treating positive, negative and cognitive symptoms of schizophrenia with mild to moderate, non-significant adverse events. Since Cariprazine has not been reported to have serious metabolic disorders, it has the potential of replacing Aripiprazole as the 1st line drug for treating schizophrenia.

**Enhancing Pharmacy Student Engagement in Pharmaceutical Research.** Sigrid C. Roberts, *Pacific University Oregon*, Ashim Malhotra, *Pacific University Oregon*, John Harrelson, *Pacific University Oregon*, Brendan Stamper, *Pacific University Oregon*, Leslie Devaud, *Pacific University Oregon*, Fawzy A. Elbarbry, *Pacific University Oregon*, Deepa Rao, *Pacific University Oregon*, Amber V. Buhler, *Pacific University Oregon*, Reza Karimi, *Pacific University Oregon*. **Objectives:** The two objectives of our initiative were to increase the number of pharmacy students participating in pharmaceutical research and to develop structured programs that ensure quality experiences. **Method:** To increase awareness about pharmaceutical research opportunities, we reached out to pharmacy students with targeted advertisement. To improve structure and quality of the research experience we developed programmatic approaches in a stepwise fashion, leading from volunteer opportunities, to electives, and finally a research track. In addition, a summer research award program was initiated that offers 8-week summer research to accepted pharmacy students before they start the didactic program. **Results:** The Pacific University School of Pharmacy opened its research laboratory in 2011. During the first years, only a few volunteers and Advanced Pharmacy Practice Experience (APPE) non-patient care elective students participated in research. Once we began to advertise APPE research electives in brief

15 minutes presentations, the number increased to an average of 12-15 APPE students per year. In AY 2015/16 we initiated research electives with 9 enrolled students. In AY2016/17, we implemented a research track with currently nine enrolled students. An additional 16 students are enrolled in research electives. Six students applied for the inaugural Summer Research Award program with five students receiving awards. **Implications:** Our combined approach of raising awareness and structured opportunities for pharmacy students has yielded a substantial increase in research participation in the pharmaceutical science laboratory. These opportunities foster critical thinking, problem solving, and other components of CAPE Educational Outcomes and ACPE standards 2016.

**Experiencing Empathy: Supportive Care Baskets for Fort Wayne Medical Oncology and Hematology Patients.** Diane M. Calinski, *Manchester University*, Kierstan M. Hanson, *Manchester University*, Brian S. Henriksen, *Fort Wayne Medical Education Program*. **Objectives:** We partnered with the Fort Wayne Medical Oncology and Hematology group to provide our students the opportunity to create a supportive care basket (SCB) and teach patients about supportive care therapies that are readily available to the community. The experience trained our students in providing supportive care for oncology patients as practicing community pharmacists. **Method:** Sixteen student teams interviewed an assigned patient and assembled a SCB specific to that patient's needs. Teams presented the basket in the Pharmacy Practice Laboratory and, subsequently, to the patient. A debrief session with the laboratory coordinator and a written reflection concluded the experience. Students were surveyed regarding the use of empathy in patient care using the Kiersma-Chen Empathy Survey. Student written reflections were also evaluated. **Results:** The SCB project had a tremendous positive impact on patients, patients' families, students, and the community as a whole. The investigators and other members of the Manchester community received positive feedback in the forms of emails and voicemails from patients and patients' families. Based on our surveys and analysis of the student reflections, following the experience students more strongly agreed that empathy is necessary for whole-patient care. Additionally, the students were more confident about employing empathetic skills while practicing patient care. Finally, the experience exposed the students to an infusion room setting and created several interprofessional interactions with the infusion center nurses. **Implications:** This experience emphasized the integration of didactic learning into real patient care and strengthened our students' compassionate nature while providing an important service to the Fort Wayne community.

**Faculty Perspectives on Research and Scholarship at Private Non-Profit Versus Private For-Profit Pharmacy Teaching Institutions.** Manas Mandal, *Roseman University of Health Sciences*, Rajan Radhakrishnan, *University of Charleston*, Rajesh Vadlapatla, *Marshall B. Ketchum University*. **Objectives:** To compare the faculty perspectives on research and scholarship in teaching focused private non-profit versus private for-profit pharmacy institutions. **Method:** A validated survey with IRB clearance was administered to the faculty through deans of the respective institutions identified via AACP database, mission-vision statement, analysis of research activities and grant award. Collected, blinded data were analyzed and reported in aggregate. **Results:** Out of 176 faculty responder, 76% belonged to private non-profit institution (NPI) and 24% belonged to private for-profit institution (FPI). Seventy seven percent of NPI and 90% of FPI institutions identified themselves as teaching-focused. Seven percent of faculty at FPI was instructors compared to none at NPI. On average, NPI faculty taught 9 hours/year compared to 32 hours/year for FPI faculty. Seventy percent

of the NPI faculty reported 'not planning to apply for grants' compared to 34% FPI faculty that resulted in lower grant awards to FPI (27.5%) compared to 58.26% NPI faculty. NPI faculty disagreed (31.5%) on clarity of institutional scholastic expectation at hiring compared to 17.5% FPI faculty. Forty five percent NPI and 37.5% FPI faculty agreed on justified institutional expectation on research with available resources. High level of institutional encouragement in pursuing scholarship of teaching and learning was reported by both NPI (88%) and FPI (92.5%) faculty. **Implications:** NPI differed from FPI in faculty rank, teaching-load, grant application-award, available resources and institutional expectation on scholarship. Understanding these differences may enable institutions crafting appropriate policies for future success in research and scholarship fulfilling ACPE Standards 2016 requirements.

**Fill in the Blank Activities are More Effective in Concept Retention Over Web-Based Gaming.** Wasana K. Sumanasekera, *Sullivan University*, Chase Turner, *Sullivan University*, Travis Jent, *Sullivan University*. **Objectives:** To investigate whether incorporation of effective active learning strategies aid students to retain concepts better. **Method:** To assure the novelty of this project, a comprehensive literature search was performed utilizing several data bases. Three groups of second year pharmacy students (graduating classes of 2016, 2017, 2018) were utilized. The class of 2016 (control group) were taught utilizing only traditional teaching methods. Classes of 2017 and 2018 students were exposed to multiple active learning strategies including web-based gaming, cross word puzzles, videos, and fill in the blank activities. Each group was taught 4 major topics under a Pharmacology course. This course was offered to the classes of 2016-2018 during the fall quarters of 2014-2016. The same instructor taught and wrote exam questions to each group of students. The test groups received same exam questions as the control group with few additional questions of equal difficulty. Students' ability to retain concepts was assessed by the examsoft item analysis data. For each topic, percent students answered questions correct were compared against the teaching strategy used. Among several exams, only the cumulative final exam was excluded from the analysis. **Results:** Statistical analysis was performed using T-test and Mann-Whitney rank sum test. Compared to the class of 2016 students' performance (85% - 91%), the class of 2017 (97%) and 2018 (94%) students performed significantly better in areas where fill in the blank tables and videos were utilized in teaching. **Implications:** Learning approaches geared towards better concept retention provide skills necessary for future pharmacists to deliver better patient-centered care.

**Impact of High-Fidelity Simulation on Pharmacology Knowledge Acquisition and Retention.** Teresa M. Seefeldt, *South Dakota State University*, Surachat Ngorsuraches, *South Dakota State University*, Brittney A. Meyer, *South Dakota State University*. **Objectives:** To determine if high-fidelity simulations improve pharmacology knowledge acquisition and retention in second-year student pharmacists. **Method:** A randomized, non-blinded, practical design was utilized. Half (n=39) were randomized to an early intervention group and participated in a pharmacology simulation. The remaining students (n=39) were assigned to a delayed intervention group and completed the simulation three weeks later. A baseline pharmacology knowledge assessment was administered to all students prior to the first simulation. A second assessment was administered following the simulation to assess impact on knowledge acquisition. Retention was evaluated with a third assessment three weeks after the first simulation. **Results:** There was no significant difference in the change in total score from baseline to the second assessment for either the early or delayed intervention groups (0.03+1.99 vs 0.18+1.56, respectively, p=0.78),



indicating that the simulation did not impact knowledge acquisition. Scores on the second and third assessments were compared for the early intervention group to evaluate retention. The change in total score was not statistically significant ( $0.03+2.42, p=0.94$ ), but since no change from baseline was observed, the impact on knowledge retention was inconclusive. Individual item analysis revealed a decrease in correct responses on one question ( $p=0.04$ ); further analysis indicated this may have occurred due to a cognitive error (availability bias) as several students changed their answers to the medication utilized in the simulation. **Implications:** High-fidelity simulations did not improve students' pharmacology knowledge acquisition. Additional research is needed to fully evaluate impact on retention. Faculty should be aware of the possibility of cognitive errors in simulations.

**Implementation of Drug Knowledge Competencies in a Pharmacology Sequence.** Lunawati L. Bennett, *Union University*. **Objectives:** Students frequently struggle to develop a working drug knowledge base. This is most notable when transitioning to the 2nd professional year with a lapse between the 1st year and use into subsequent courses. Evidence suggests that spaced review enhances long-term learning. This project describes the substitution of comprehensive course finals in a three semester pharmacology sequence with capstone drug knowledge competencies incorporated into the subsequent semesters. **Method:** The three semester pharmacology sequence begins spring of the 1st year. Second year pharmacy students were provided directed study guides prior to the start of the 2nd and 3rd semesters. Important pharmacology facts, common adverse effects, boxed warnings, and pregnancy category (D or X) were highlighted. The competency was administered at the beginning of each semester, comprising approximately 2% of the overall grade. Competency requirements were satisfied by earning  $\geq 75\%$ . Student who were unsuccessful ( $<75\%$ ) on the first attempt were given 2 additional attempts to pass. Otherwise, they received a failing course grade. **Results:** In the three years since its inception, a passing grade on the first attempt range from 67% to 80% per attempt. A strong correlation was seen between competency and overall course performance. All students successfully passed the competency within the allowed attempts. **Implications:** The conversion from semester cumulative exams to capstone drug knowledge competencies has successfully allowed for spaced review strategy. It also requires additional review for students failing on the first attempt. Further work is needed to investigate its impact on long-term retention of key knowledge.

**Metabolic Activation of Sunitinib by Cytochrome P450 1A2 and CYP3A4.** Gracia M. Amaya, *Lipscomb University*, Rebecca Durandis, *Lipscomb University*, David S. Bourgeois, *Lipscomb University*, Klarissa D. Jackson, *Lipscomb University*. **Objectives:** Sunitinib is an oral, multi-targeted tyrosine kinase inhibitor approved for the treatment of renal cell carcinoma, gastrointestinal stromal tumors, and pancreatic neuroendocrine tumors. However, clinical use of sunitinib is associated with potentially severe idiosyncratic liver injury. The mechanisms of this toxicity are unknown. We hypothesized that metabolic activation of sunitinib to form a reactive, potentially toxic quinoneimine metabolite may contribute to the development of sunitinib-induced liver injury. The purpose of this study was to define the role of cytochrome P450 (CYP) enzymes in the metabolism and bioactivation of sunitinib to provide insight into the mechanisms of drug toxicity. **Method:** Metabolic incubations were performed using human liver microsomal fractions, individual recombinant P450 enzymes, and P450-selective chemical inhibitors. Glutathione (GSH) was used as a trapping agent to detect reactive metabolites. Sunitinib metabolites were analyzed by liquid chromatography-tandem mass spectrometry.

**Results:** Recombinant CYP3A4 was the major enzyme to form the primary metabolite N-desethyl-sunitinib. CYP1A2 generated the highest levels of the reactive quinoneimine metabolite trapped as GSH conjugates. In human liver microsomal incubations, CYP3A inhibitor ketoconazole reduced formation of N-desethyl-sunitinib by 77%, while CYP1A2 inhibitor furafylline decreased generation of reactive metabolite-GSH conjugates by 61%, compared to control levels. Moreover, inhibition of CYP3A and CYP1A2 reduced GSH conjugates by 85%, compared to control. **Implications:** These data indicate that both CYP3A4 and CYP1A2 are involved the metabolic activation of sunitinib. Collectively, these findings provide the basis for future studies to explore the impact of P450 genetic variations and environmental factors on sunitinib metabolism and toxicity.

**Modulation of Ocular Mucins by Glucocorticoid Receptor Activation.** Ajay Sharma, *Chapman University*, Jonathan Taniguchi, *Chapman University*. **Objectives:** Ophthalmic glucocorticoids are often used to treat ocular surface inflammation. A decrease in ocular surface inflammatory cells and cytokine levels has been shown to contribute to the ameliorative effect of glucocorticoids. Mucins are vital for keeping the ocular surface moist and lubricated. The present study investigates the effect of glucocorticoid receptor activation on modulation of ocular surface mucins. **Method:** Human conjunctival epithelial cells and human corneal epithelial cells were exposing to 25, 50 100 nM of fluorometholone, a glucocorticoid receptor agonist. To test whether the fluorometholone-mediated modulation of mucin expression was glucocorticoid receptor mediated, the cells were exposed to fluorometholone alone or along with mifepristone (10  $\mu\text{M}$ ), a glucocorticoid receptor antagonist. The cells were harvested at 12 and 24 hours of fluorometholone +/- mifepristone exposure. The mRNA isolation, cDNA preparation and protein extraction was performed. The mucins 1, 4, 5AC, 16 & 19 gene expression and protein quantification was done using real time PCR and ELISA. **Results:** Fluorometholone caused a dose dependent increase in the expression of ocular mucins in the conjunctival and corneal epithelial cells, and the results were statistically significant after 24hour exposure at 50 and 100 nM dose. Mifepristone significantly antagonized fluorometholone-mediated increase in ocular mucins suggesting that increase in ocular mucins was mediated by activation of glucocorticoid receptors. **Implications:** Glucocorticoid receptor activation increases the expression of ocular mucins. The observed increase in mucins may be a novel mechanism underlying the therapeutic benefits of glucocorticoids in ocular surface inflammatory diseases besides the well-documented antiinflammatory effect.

**Obsessive-Compulsive Disorder and Alcohol Dependence: Shared Pathways?** Elizabeth LaRose, *Western New England University*, Allissa M. Long, *Western New England University*, Jake J. Bouchard, *Western New England University*, Jilla Sabeti, *Western New England University*. **Objectives:** Objectives: Although obsessive-compulsive disorder (OCD) is primarily viewed as an anxiety disorder, human studies suggest it may share features resembling addictive behavior. The connections between drug abuse in early-life and risk for later emergence of compulsive behavior are not well understood. This study addressed the question of whether alcohol exposure during the sensitive period of adolescent development increases later OCD risk via a sensitization process involving the dopamine-AKT signaling pathway. **Method:** Methods: Male Wistar rats were exposed as early-adolescents (~28 days old) to intoxicating alcohol vapor concentrations for 14 days, a procedure known to induce alcohol dependence (Sabeti 2011). After a protracted period of alcohol abstinence, we subjected rats as matured adults to repeated injections of the dopamine D2

agonist quinpirole, using an established paradigm reported to elicit OCD-checking behavior in rodents (Szechtman, 1998). Different brain regions were analyzed specifically for elevated PI3K/AKT phosphoisoforms using a capillary nanoimmunoassay (Peggy Sue™ Simple Western technology). Mean value differences were analyzed with t-tests. **Results:** Compared to ethanol naïve rats, rats with a positive history of alcohol exposure exhibited the greatest OCD-checking behavior and sensitization to quinpirole, in parallel with elevations in several phosphorylated AKT isoforms. AKT1-3 isoforms were specifically hyper-phosphorylation at discrete residues (Serine-473). This change was greatest in hippocampus, next in striatum, and least in brainstem, as anticipated by relative D2 receptor expression in these regions. **Implications:** Implications: Alcohol exposure in adolescence facilitated expression of OCD-checking behavior. Our data suggest that OCD and alcohol dependence may be connected through the AKT signaling pathway.

#### **Optimization of Colorimetric $\beta$ -Hematin Formation Assay Method for Antimalarial Drug Leads Screening.**

Mohammad F. Hossain, *Marshall University*, Shoshi Chowdhury, M. Omar F. Khan, *Marshall University*. **Objectives:** To facilitate our in-house antimalarial drug discovery program a study was designed to optimize the currently available  $\beta$ -hematin formation assay methods by understanding, reducing, and controlling sources of variability. **Method:**  $\beta$ -Hematin formation was initiated from commercially available hemin chloride by addition of Tween 20 at the molar ratio of hemin: Tween of 2:1. The antimalarial drug chloroquine diphosphate, an inhibitor of  $\beta$ -hematin formation, was used as a reference drug standard at different concentrations to determine the IC<sub>50</sub> value. All the experimental solutions and samples were prepared following standard protocol. A 96-well plate with all the test solutions was incubated for 4 hours at 37° C and shaken at 75 rpm. The percentage of  $\beta$ -hematin formation was calculated by quantifying the unreacted hemin in solution at the detection wavelength of 405 nm using Multi-Mode Microplate Reader. The optimized method was validated by checking the specificity, linearity, repeatability, reproducibility and robustness. **Results:** The  $\beta$ -Hematin formation assay method is found to be specific with the detection limit of 0.4 nmol, linear ( $y = 0.1106x - 0.0019$ ,  $R^2 > 0.999$ ), reproducible (% $\beta$ -Hematin Assay  $\pm$  %RSD (Average;  $86.2 \pm 1.5$ )) and robust with respect to incubation time  $4 \pm 1$ h and shaking  $75 \pm 15$  rpm. The method was also found with lower variability in comparison to literature methods. The IC<sub>50</sub> value for inhibition of  $\beta$ -hematin formation by chloroquine was found to be  $18.5 \pm 0.5$  nmol. **Implications:** In conclusion, this user-friendly optimized assay method can be easily used for high throughput screening of novel antimalarial drug leads in any laboratory.

#### **Oxidized Products of Cannabidiol Inhibit Topoisomerase II $\alpha$ .**

James T. Wilson, *Lipscomb University*, Cole A. Fief, *Lipscomb University*, Klarissa D. Jackson, *Lipscomb University*, Susan L. Mercer, *Lipscomb University*, Joseph E. Dewese, *Lipscomb University*. **Objectives:** Cannabidiol is a significant phytocannabinoid component of cannabis that lacks psychotropic effects. It is critical to understand both the pharmacologic and toxicologic properties of this compound and its derivatives as a matter of public health. The cannabidiol derivative, HU-331, inhibits topoisomerase II, which is a known anticancer drug target. We set out to examine whether cannabidiol inhibits the catalytic activity of topoisomerase II $\alpha$ . Additionally, we explored whether human liver microsomes could metabolize cannabidiol into HU-331. **Method:** We performed in vitro assays with cannabidiol and oxidized cannabidiol species to examine DNA cleavage, DNA relaxation, ATP hydrolysis, and DNA binding activities of topoisomerase

II $\alpha$ . Further, cannabidiol was incubated with human liver microsomes and metabolites were analyzed using mass spectrometry (LC-MS/MS). Oxidized species also formed non-enzymatically in solution as confirmed by LC-MS/MS. **Results:** Our studies show that only oxidized cannabidiol inhibits topoisomerase II $\alpha$  relaxation activity and ATP hydrolysis at 50-100  $\mu$ M. Both oxidized cannabidiol and HU-331 appear to reduce enzyme:DNA binding. These compounds also display the ability to stabilize the N-terminal protein clamp of topoisomerase II $\alpha$ . Metabolism of cannabidiol in human liver microsomes revealed that cannabidiol is oxidized to form products with the same mass as HU-331. **Implications:** Only oxidized cannabidiol inhibits the ATPase, relaxation, and DNA binding activity of topoisomerase II $\alpha$ . Microsomal oxidation of cannabidiol generates oxygenated metabolites including the cannabinoid quinone. Taken together, our work provides a basis for further exploration of the therapeutic and toxicologic properties of cannabidiol and the application of cannabis in anticancer therapy.

#### **Predictors of Performance of Students in a Biomedical Science Course in PharmD Curriculum.**

Yuan Zhao, *Sullivan University*, Samiha Hindi, *Sullivan University*, Thanh Lan Nguyen, *Sullivan University*. **Objectives:** To evaluate the impact of multiple factors on students' performance in an immunology course in PY1 PharmD curriculum. **Method:** 85 (100%) students enrolled in immunology course were included in the study. Students' in-class participation rate and accurate instant response rate were recorded in TurningPoint. Average quiz and pre-final exam scores were recorded in ExamSoft. Students self-reported information regarding prior exposure to immunology course, utilization of textbook, number of study hours were obtained at the end of the quarter using a questionnaire. Cumulative final exam grade was used as measure of course performance. Pearson correlation coefficient was calculated to measure the linear correlation between data set; linear regression was used to explain the predictor for immunology final exam grade. **Results:** The prior immunology background, in class participation rate, study hours, and utilization of the textbook did not significantly correlate with the immunology final exam grade. Instead, accurate instant response rate ( $r=0.271$ ,  $P<0.05$ ), average quiz score ( $r=0.56$ ,  $P<0.01$ ), average pre-final exam scores ( $r=0.548$ ,  $P<0.01$ ) were significantly correlated with the final exam grade. The linear regression model found that average quiz and pre-final exam scores were the strongest predictors of final exam grade accounting for 31.4% and 34.7% respectively, of the variance in the final exam grade. **Implications:** Identification of the effect of valid factors on students' academic performance is of great importance to improve instructional design and student counseling. Our data suggest active in-class engagement as well as test questions design/delivery are key in helping students succeed in a course.

#### **Relationship Between Oxidant Production and Cardiovascular Adverse Effects of Attention-Deficit/Hyperactivity Disorder Medications.**

Danielle L. Cruthirds, *Samford University*, Courtney Bishop, *Samford University*, Marshall E. Cates, *Samford University*. **Objectives:** Several classes of medications are used in the treatment of attention-deficit/ hyperactivity disorder (ADHD). Some of these agents have the potential for cardiovascular adverse effects, especially with long-term use. The purpose of this study was to determine the effect of these medications on superoxide dismutase (SOD) activity, an indirect marker of oxidant production, and whether a correlation exists between changes in SOD activity and potential for cardiovascular adverse effects. **Method:** SOD activity was measured using an in vitro assay from Cayman Chemicals. The 96 well plate assay utilizes a tetrazolium salt for detection of superoxide radicals generated by

xanthine oxidase and hypoxanthine. The SOD activity of each sample was calculated as an indirect marker of oxidant production. Representative medications were selected from three different classes: antidepressants (bupropion and desipramine); alpha 2 agonists (clonidine and guanfacine); and stimulants (dextroamphetamine). Alpha 2 agonists and antidepressants possess the lowest potential for cardiovascular adverse effects, whereas stimulants possess the highest. Varying relevant concentrations of each medication were tested based on established therapeutic serum levels. **Results:** Dextroamphetamine displayed the greatest change in SOD activity. These increases in SOD activity were shown to be dose-dependent. Bupropion, desipramine, clonidine, and guanfacine showed minimal effects on SOD activity. **Implications:** Results from this study show a correlation likely exists between oxidant production and propensity for ADHD stimulant medication-induced cardiovascular adverse effects (dextroamphetamine). Given the long-term use of these medications in certain patients, further investigation into the mechanisms of cardiovascular adverse effects could aid in treatment decisions.

**Renin-Angiotensin-Aldosterone System Blockade and Nephrylsin Inhibition as Modifiers of Outcome in an Alzheimer's Disease Model.** Bradley Luke Saunders, *Samford University*, Peter M. Abadir, *Johns Hopkins School of Medicine*, Maria De Luca, *University of Alabama at Birmingham*, Patricia Jumbo-Lucioni, *Samford University*. **Objectives:** Alzheimer's Disease (AD), the most common neurodegenerative disorder, is characterized by progressive behavior and early synaptic deficits. Little progress has been made in identifying effective therapies. Potential benefit in AD incidence and progression may derive from renin-angiotensin-aldosterone system (RAAS) blockade. Pharmacological RAAS blockade is the current standard of care in heart failure (HF), a condition characterized by an overactive RAAS. Concomitant inhibition of nephrylsin through sacubitril (in LCZ696) has proved superior to RAAS inhibition alone in treating HF. Nephrylsin degrades vasoactive peptides but is also the dominant degrading enzyme of amyloid plaques in the brain. While good for the heart, it is unknown whether nephrylsin inhibition can initiate new-onset disease or exacerbation of underlying AD. **Method:** Our study aims to test whether pharmacological RAAS blockade with or without nephrylsin inhibition modifies behavioral/synaptic deficits characterizing a *Drosophila melanogaster* (fruit fly) AD model. Enzymes regulating RAAS in vertebrates are also present in the fly. Locomotion and synaptic deficits will be tested after treatment with valsartan with and without sacubitril. **Results:** Our preliminary results show that pharmacological RAAS blockade significantly decreases mitochondria respiration and oxidative stress levels among wild-type cohorts. **Implications:** Oxidative stress has a pathogenic role in AD, so we anticipate that RAAS blockade with valsartan will reverse behavioral deficits in our AD model. Concomitant nephrylsin inhibition, however, may worsen AD defects. Aging and existing co-morbidities like AD may put cardiovascular patients taking LCZ696 at an increased risk of developing neurocognitive defects due to nephrylsin inhibition. Our study will provide important and opportune signals on this issue.

**Repurposing FDA-Approved Raloxifene to Investigate Mitochondrial Dynamics in Pancreatic Adenocarcinoma.** Quintin Love, *Pacific University Oregon*, Adeleke Badejo, *Pacific University Oregon*, Heather True, *Pacific University Oregon*, Ellyssa Szlavich, *Pacific University Oregon*, Jordan McCreary, *Pacific University Oregon*, Ashim Malhotra, *Pacific University Oregon*. **Objectives:** Our main goal was to investigate the role of mitochondrial fission, fusion, and energetics on autophagy and apoptosis in cellular models of pancreatic adenocarcinoma (PCa). **Method:** PCa has a high mortality and a poor

5-year survival rate post diagnosis. In 90% patients, there is a mutation in the human homologue of the Kirsten Rat Sarcoma viral oncogene (KRAS). Using mutant and wild-type KRAS expressing human PCa cells, we investigated the effect of treatment with the selective estrogen receptor modulator drug raloxifene on mitochondrial dynamics. Raloxifene was selected because it can cause apoptosis in multiple cancer cells. Specifically, we tested mitochondrial viability (MTT assay), ROS, and ATP production and regulation of the proteins involved in mitochondrial biogenesis (PGC-1alpha) and dynamics like fission (Drp-1) and fusion (OPA1) events. **Results:** 1) Raloxifene reduced mitochondrial viability in both mutant and wild-type KRAS PCa cells, with greater loss in mutant cells. However, it 2) decrease ATP levels while 2) increasing ROS production in mutant versus wild-type KRAS cells. Raloxifene also induced the expression of PGC-1alpha and Drp-1, suggesting that it can regulate mitochondrial production and dynamics, while it had no effect on OPA1 levels. **Implications:** Raloxifene can effect mitochondrial biogenesis and dynamics in PCa. Changes in mitochondrial structure, function and biogenesis may be used to kill PCa cells.

**Sleep Quality Assessment in Young Collegiate Adults Using Ambulatory ECG Recordings.** Jake J. Bouchard, *Western New England University*, Allissa M. Long, *Western New England University*, Uyen Nguyen, *Western New England University*, Jilla Sabeti, *Western New England University*. **Objectives:** Objectives: Much existing data on sleep quality in young college students derives from retrospective self-report measures, which carry a risk of over- or underestimating sleep in this group. This study utilized an ECG-based sleep recorder device (SleepImage Technology) to assess sleep quality in college students with or without self-reported sleep complaints. **Method:** Methods: Participants (N = 83; mean age 22.8 +/- 0.3 years old) completed a consecutive 2-night sleep study in the fall or spring semesters. Subjects were instructed on a procedure for self-applying the sleep data recorder device during sleep at home. Biometric data collected included: autonomic measures of sleep (heart rate variability and ECG-derived respiration rate), snore, and actigraphy data. The standard self-report Pittsburgh Sleep Quality Index was also administered. Sleep variables were analyzed by ANOVA, and observed frequencies (counts) of poor physiologic sleep quality were analyzed by chi-square tests using Graphpad Prism-6 software. **Results:** Results: The key findings of this study were as follows: (1) objective ambulatory assessments of sleep were feasible in college students with remote ECG recordings (94% completion rate); (2) over 40% of the college students sampled exhibited reduced REM and stable non-REM sleep states; (3) a striking lack of correlation between subjective (PSQI) and objective (ECG-based) sleep quality markers was seen in >50% of cases; and (4) male students were more likely than their female peers to overestimate their sleep quality, relative to their actual biometric measurements. **Implications:** Implications: These findings suggest that sleep problems are not only common but also under-recognized by young collegiate adults.

**Strategies to Improve Academic Performance Through Rho Chi Intervention.** LaTasha Marshall, *University of Charleston*, Ojong Bate, *University of Charleston*, Rebecca S. Linger, *University of Charleston*. **Objectives:** Our objective is to assess tutoring effectiveness within pharmacy programs. Our goal was to confirm if the tutoring services provided by Rho Chi Honor Society increase a student's success outcomes. **Method:** Our research was conducted as a double-blinded survey. Prior to recruitment, an email was sent out to the pharmacy student body requesting willingness to participate in our survey. Participants must have current or previous experience with

Rho Chi tutoring. All participants were given a survey in the beginning of the semester and another towards the end of the semester, to evaluate their satisfaction with tutoring services. All data collected was statistically analyzed and results are described. **Results:** Our data indicated over 65% of students who received tutoring were first or third year students. Individuals also identified using Rho Chi tutoring services more than once during the academic year. Of the many subjects tutored, most received help with Immunology, Pathophysiology, and Pharmaceutics. In the post survey, over 70% of students indicated their exam averages increased and they would recommend tutoring services to their peers. **Implications:** There was a clear correlation between academic performance and tutoring. We hope our results encourage students to pursue the benefits of Rho Chi tutoring; while also encouraging more Rho Chi members tutor their peers. By our efforts we hope to decrease remediation rates by increasing the promotion and availability of Rho Chi tutoring services.

**Study of Penicillin Tolerance Group B Streptococci Strains.** Paramita Basu, *Touro College of Pharmacy-New York*, Priyank Kumar, *Touro College of Pharmacy-New York*, Jesse Flores, *Touro College of Pharmacy-New York*, Jennifer Tsan, *Touro College of Pharmacy-New York*, Sarah Seidler, *Lander College for Women*, Mir Mahmood, *Touro College of Pharmacy-New York*, Anh Duong, *Touro College of Pharmacy-New York*, Thu Nguyen, *Touro College of Pharmacy-New York*.

**Objectives:** Group B strep (GBS) remains a leading cause of neonatal infection despite careful screening and antibiotic treatment guidelines. Though all pregnant women undergo screening for GBS, infections may persist due to penicillin tolerance in which a treated organism is growth-inhibited, but remains viable for a longer time. The purpose of this study is to measure penicillin tolerance in 2 lab strains of *Streptococcus* and characterize them as susceptible or tolerant to penicillin. **Method:** We examined two different GBS strains, *S. agalactiae* strains A909 and O90R to determine their tolerance levels to Penicillin. A survival assay was done to compare the rate of survival of GBS A909 and O90R strains after incubation in increasing concentrations of Penicillin. In addition, a cell lysis assay via optical density measurements and colony counts were used to classify either strain as a penicillin tolerant or susceptible strain. **Results:** On penicillin exposure, GBS A909 strains demonstrated a rapid decline in survival rate compared to GBS O90R. There were greater incidences of bacterial growth after 48 hours of penicillin exposure seen in GBS O90R than GBS A909. Higher OD600 were obtained from O90R than A909 after penicillin treatment indicating that O90R tolerant strains are subjected to less cell lysis than A909 susceptible strain. **Implications:** GBS A909 showed decreased colony counts at low penicillin concentration levels while these same doses did not reduce GBS O90R counts. Based on the MIC90 survival assay and the lysis observed, O90R can be classified as Penicillin tolerant and A909 as a penicillin susceptible strain.

**Studying the Inhibitory Effect of Quercetin and Thymoquinone on Human Cytochrome P450 Enzyme Activities.** Aimy Ung, *Pacific University Oregon*, Fawzy A. Elbarbry, *Pacific University Oregon*. **Objectives:** This study was conducted to determine the inhibitory effect of Quercetin (QR) and Thymoquinone (TQ), two commonly used remedies, on the activities of selected Cytochrome P45 (CYP) enzymes that play important role in drug metabolism and/or toxicology. **Method:** The in-vitro studies were conducted using either fluorescence- or luminescence-based high throughput assays with human c-DNA baculovirus expressed CYP enzymes or validated HPLC methods. **Results:** Compared to positive control CYP inhibitors, neither QR nor TQ demonstrated a significant inhibitory effect on CYP1A2 or CYP2D6. On the other hand, both QR and TQ gave

moderate to strong inhibitory effects on CYP2C19, CYP2E1, and CYP3A4 with IC50 values in the range of 0.5-4 fold the IC50 values of the studied positive controls. **Implications:** The findings of this study may indicate that administration of QR or TQ with drugs that are metabolized by CYP2C19, CYP2E1, or CYP3A4 may contribute to herb-drug interactions.

**Training Future Pharmacists Using a Novel Pharmacogenomics Assay.** Amber Frick, *University of North Carolina at Chapel Hill*, Olivia Dong, *University of North Carolina at Chapel Hill*, Oscar Suzuki, *University of North Carolina at Chapel Hill*, Rachel Howard, *University of North Carolina at Chapel Hill*, Cristina Benton, *Jacqueline McLaughlin, University of North Carolina at Chapel Hill*, Robert E. Dupuis, *University of North Carolina at Chapel Hill*, Tim Wiltshire, *University of North Carolina at Chapel Hill*. **Objectives:** Pharmacogenomics, a precision pharmacotherapy cornerstone, is currently being implemented within clinical settings. Healthcare providers well-versed in pharmacogenomic knowledge (e.g., interpretation of results and the risks, benefits, and limitations of testing) are essential to this process. Educational initiatives are necessary to enhance adoption by healthcare providers and overcome barriers to implementation. **Method:** We surveyed second year student pharmacists, enrolled in a mandatory, 15-week clinical pharmacology course, regarding attitudes and self-perceived competence on pharmacogenomics prior to and following an educational intervention. This intervention included optional, voluntary personalized genotyping with a panel constructed in-house using a molecular inversion probe assay. Participating students provided buccal swab samples and only actionable pharmacogenes were determined (i.e., CYP2C19, CYP2C9, CYP2D6, CYP3A4/5, DPYD, G6PD, IFNL3, NAT2, RYR1, SLCO1B1, TPMT, and VKORC1). Paired pre- and post-intervention responses were analyzed with Wilcoxon signed-rank tests. **Results:** Responses were analyzed for student pharmacists who completed the pre- (N=143, 97% response rate) and post-intervention survey (N=128, 87% response rate). One hundred twenty-three student pharmacists received pharmacogenomics results; 87% felt their learning was enhanced by undergoing personal genotyping, and 91% felt they had a better understanding of pharmacogenomics on the basis of undergoing genotyping. From pre- to post-intervention, students significantly increased their self-perceived ability to identify therapeutic areas in which pharmacogenomics testing is recommended ( $p=0.03$ ) and to discuss the risks of pharmacogenomic testing with patients ( $p<0.0001$ ). **Implications:** Although genotyping with this novel platform was feasible, our findings indicate that additional opportunities for pharmacogenomic learning could be implemented in the curriculum to enhance competency in a professional capacity.

**Two Weeks of Intermittent Palatable Diet Exposure Is Sufficient to Attenuate Alcohol Drinking in Rats.** Nisha Vitlhani, *Xavier University of Louisiana*, Anna M. Smith, *Xavier University of Louisiana*, Victoria Barnett, *Xavier University of Louisiana*, Sunil Sirohi, *Xavier University of Louisiana*. **Objectives:** We have recently reported that six weeks of intermittent access to a nutritionally complete palatable diet (NPD) decreases alcohol intake in rats. Since many alcoholics are malnourished and resultant nutritional deficiencies may contribute to the pathology of alcoholism, our data have important clinical implications in the management of AUD. However, it is unknown if NPD pre-exposure duration less than 6 weeks is effective enough to attenuate alcohol drinking. Therefore, we evaluated the impact of one and two weeks of NPD exposure on alcohol drinking in male Long Evans rats. **Method:** Rats were divided into groups ( $n=6$ /group) matched based on their body weight, food and water intake. Intermittent access to

NPD (24 hrs, twice a week) or normal chow (controls) was provided for one or two weeks. All rats had ad libitum access to chow and water always and their daily food intake was monitored. Ethanol consumption was assessed following NPD exposure. **Results:** A feeding pattern of increased and decreased caloric intake was observed in the intermittent NPD groups on NPD days and chow days, respectively. A non-significant ( $p=0.125$ ) decrease in alcohol drinking was seen in one week intermittent NPD group, whereas alcohol drinking was significantly attenuated ( $p=0.008$ ) in the two weeks intermittent NPD group of rats compared to the respective chow controls. **Implications:** These data suggest that two weeks of intermittent NPD pre-exposure is sufficient to attenuate alcohol drinking in rats and identify key features of a dietary intervention that could be used to treat AUD in clinical settings.

**Use of Curricular Integration in the Assessment of Student Participation in Co-Curricular Oral Presentations.** Erica L. Rowe, *South College*, Connie F. Rust, *South College*. **Objectives:** Pearson and Hubball recognize curricular integration as a “strategy for making educational experiences coherent, relevant, and engaging; connecting diverse disciplines; and facilitating higher-order learning.”<sup>1</sup> The purpose of this study was to explore the impact of curricular integration through the incorporation of a co-curricular assessment of a Pharmaceutical Science course (PSC6130 Immunology) and a Pharmacy Practice course (PPR6260 Communications). **Method:** P1 Students were assigned to groups of two for an oral presentation of an immunology topic pertaining to an autoimmune disease or an immune deficiency. Students were expected to expand upon foundational knowledge received during PSC6130 and effectively communicate their findings to the class. The students were assessed on application of communication skills and presentation of material covered in Immunology. A post-presentation survey was administered to the students to assess student perceptions and obtain feedback on the activity. **Results:** On average, students viewed this activity as a positive experience (1.39 = strongly agree). Furthermore, the students also strongly agreed that the activity helped with public speaking and provided them with an opportunity to learn more about an immunology topic (1.41 for both = strongly agree). **Implications:** It is imperative that pharmacists possess the skills necessary to communicate to patients and health professionals in a manner that is understandable and engaging. Pharmacy curricula are changing in response to the increased need for interpersonal, and interprofessional, communication.<sup>1,2</sup> Curricular integration through oral presentations is one approach to increase student knowledge of pharmaceutical sciences and improve confidence and student self-awareness of personal communication skills.

**Using a Backwards Design Approach for Curricular Revision in a Doctor of Pharmacy Program.** Timothy J. Bloom, *Shenandoah University*, Michael L. Adams, *Campbell University*. **Objectives:** To use a backwards design approach to guide the complete revision of a Doctor of Pharmacy curriculum. **Method:** Faculty met in a brainstorming session to identify the traits (knowledge, skills and attitudes) that should describe our graduates. Faculty teams searched for literature related to development and assessment of these traits. New programmatic outcomes were adopted that were compatible with the traits and a progression toward outcomes proficiency was mapped. Courses were designed based in part on assessment of program outcomes and the teaching approaches needed to prepare student pharmacists for those assessments. **Results:** Three broad categories of graduate traits were developed: knowledge and skills, professionalism, and interpersonal skills. They were used along with our College’s mission and

ACPE Standards 2016 requirements to develop new programmatic outcomes based on the 2013 CAPE outcomes. Using an iterative series of small group discussions overseen by the curriculum committee, consensus was built regarding level of mastery of each program outcome when students began their first APPE, and then progression toward that level was mapped from the P3 year backwards toward the P1 year. A set of 63 new courses was developed over a three-year process. **Implications:** By making use of curriculum committee oversight of multiple faculty discussions and votes, a new integrated, systems-based curriculum was developed in order to achieve outcomes decided upon at the beginning of the revision process. (Note: At time of submission, Timothy J. Bloom was affiliated with Campbell University)

**Utilizing Online Bioinformatics Tools to Predict Immunological Clearance of Protein Drugs.** Lauren A. O’Donnell, *Duquesne University*, Wilson S. Meng, *Duquesne University*, Benjamin J. Andrick, *Duquesne University*, Alexa M. Borello, *Duquesne University*. **Objectives:** The objective of this study was to design a bioinformatics practicum to interrogate how patient genotypes related to immune recognition and pharmacokinetics of protein drugs. **Method:** The project led students ( $n=150$ ) through an analysis of a protein drug sequence using freely-available bioinformatics tools from the Immune Epitope Database ([iedb.org](http://iedb.org)). In Session 1, students analyzed a chosen protein drug sequence for potential epitopes within the context of a specific major histocompatibility complex (MHC)-II allele using the “MHC-II Binding Prediction” tool. In the following session, students determined whether the predicted epitopes from Part I showed sequence homology to validated T-cell epitopes within IEDB. The basis of the comparison was to identify potential crossreactive epitopes in known antigens that could contribute to the production of anti-drug antibodies. Student learning was assessed through three mechanisms (pre-lab quiz, in-lab data collection and worksheet, and a final report) that were graded by the instructors. **Results:** Students demonstrated improved understanding of the immunological principles that underpin recognition of protein drugs and the potential contribution of cross-reactivity between protein drugs and environmental antigens (89.3% and 93.2% average score, respectively). Students were less successful at speculating on alternative explanations for treatment failure with protein drugs in a patient case (76.1% average). Regardless, students reported increased confidence in each skill area as measured through pre- and post-practicum Likert scale surveys (Wilcoxin-rank test;  $p<0.05$ ). **Implications:** Our findings suggest that pharmacy students can develop a greater understanding of the relationship between immune recognition of protein drugs and patient genotype using bioinformatics tools.

**Vertical Sleeve Gastrectomy Activates TGR5 to Improve Fatty Liver and Remit Insulin Resistance in Mice.** Kyle Sousa, *West Coast University*. **Objectives:** Vertical sleeve gastrectomy (VSG) has emerged as an attractive clinical intervention given its ability to achieve greater and more sustainable weight loss than those observed with lifestyle changes or pharmacological therapy. However, the precise molecular mechanism by which this surgery exerts its beneficial effects remains elusive. We set out to determine whether bile acid signals, via the TGR5 bile acid receptor, are required for mediating the positive metabolic effects of bariatric surgery. **Method:** VSG and sham surgeries were performed on control and Tgr5<sup>-/-</sup> mice using a high-fat diet-induced obesity model. Metabolic phenotyping, histological analyses, and LC/MS were used to identify and confirm bile acid (BA)-mediated changes associated following VSG in each

surgical cohort. **Results:** We found that the expression of TGR5 increased significantly after VSG, and that VSG alters both BA levels and composition in mice, resulting in enhancement of TGR5 signaling in the ileum and brown adipose tissues, concomitant with improved glucose control, reduced hepatic steatosis, and increased energy expenditure. In the absence of TGR5, all the beneficial metabolic effects of VSG in mice are lost. **Implications:** Our data identify a relationship between the increased circulating concentrations of BAs observed after bariatric surgery and their therapeutic value on obesity, diabetes, and nonalcoholic fatty liver disease. Additionally, our study supplies evidence that VSG generates a new, steady state level of BAs that confer the metabolic benefits of VSG through activation of TGR5, suggesting that BA signals could be targeted for pharmacological interventions of type II diabetes and fatty liver disease.

### Theoretical Models

**Establishing a Postdoctoral Fellowship in a Teaching Primacy School of Pharmacy: Opportunities and Challenges.** Ashim Malhotra, *Pacific University Oregon*, Adeleke Badejo, *Pacific University Oregon*. **Objectives:** Our main goal was to design and implement innovative postgraduate opportunities in academic pharmacy to train the next generation of basic science professoriate. Our program was intended to provide an immersive blend of teaching, scholarship, and service activities in commiseration with the tripartite academic model. **Method:** One Postdoctoral Fellow (PF) in Pharmaceutical Sciences position was created and a PF was accepted into this program in 2015. The PD was assigned service on one SOP Standing Committee, 6 hours of classroom teaching per semester, monthly Pedagogy and Assessment Journal Club facilitation, and training in Boyer's scholarship of teaching or discovery research. Additionally, he completed the Oregon Pharmacy Teaching Certificate and attended monthly faculty development workshops. The PF's progress was assessed by survey instruments disseminated to multiple stakeholders, including students, faculty, and Committee Chairs. Classroom teaching was assessed by standardized SOP student survey instruments, and via faculty and peer observations. **Results:** To enable analysis, survey results were categorized into three main components: 1) students' perception of teaching attitudes, 2) faculty, and 3) peer observations. The PF scored above 90% in the following categories on the student survey instrument: 1) Instructor made course goals clear, 2) was professional, and 3) well-paced and organized. Total service hours and specific contribution to Committees was tracked. Progress was discussed in personal meetings and pedagogical workshops. **Implications:** To our knowledge, this is a unique program that offers integrated pharmacy academia training experiences to a diverse learner population.

**Eww! That Is Gross! Acquainting Pharmacy Students With Neglected Tropical Parasitic Diseases.** Paulo Carvalho, *University of the Incarnate Word*. **Objectives:** To implement an elective course giving student pharmacists an overview of Neglected Tropical Diseases, focusing on the importance of being ready to ask the right questions to a patient potentially suffering one of those infections in order to help him or her to find appropriate health care. **Method:** The course was created and offered at Notre Dame of Maryland University, and classes were presented in an informative/documentary format, with lectures focused in answering four questions: What is the disease? How is it transmitted? What is its importance for the US? How is it diagnosed/treated? Videos 5 to 15 minutes in length were presented for each disease and the students were given the opportunity to share any experience or knowledge they might have had of that disease. **Results:** Students were often surprised by the variety of symptoms presented by

those diseases and by the fact that many of them are currently of Public Health concern for the United States, presenting a real possibility of pharmacists being able to help someone in their practice someday. The course was well received and quite sought after during course sign up.

**Implications:** International travel, migratory movements and military deployments have increased the exposure of United States citizens to Neglected Tropical Diseases. The growing role of pharmacists as health agents plus their traditional accessibility and trustworthy image calls for at least a basic knowledge of those diseases for properly advising patients towards the appropriate diagnosis and treatment.

## CHEMISTRY

### Completed Research

**Blending Traditional Lecture With Active Learning Techniques in Teaching Pharmaceutical Biochemistry Course.** Jozef Stec, *Marshall B. Ketchum University*. **Objectives:** There is stimulated interest in the implementation of teaching methods that promote active and collaborative learning experience in pharmacy education. Active learning helps the students to (i) create better understanding of the taught material, (ii) spark intrinsic motivation, and (iii) foster a sense of community, connection and life-long learning. On the other hand, students occasionally indicate the preference for lecture-like delivery of the key concepts. Accordingly, blended approach was utilized to teach Pharmaceutical Biochemistry course. **Method:** Forty-three students participated in Pharmaceutical Biochemistry course and were exposed to a blended learning approach. All of the enrolled students completed pre- and post-course surveys containing 12 questions each with response options on a Likert scale. In addition, after each session students completed short survey which gaged their perceptions about various aspects of the individual session in the course. **Results:** Overall, great majority of the students found the blended model to be interesting, engaging, and instrumental in understanding of the taught concepts. Students also agreed that the interactive sessions required integration and application of basic science knowledge to the field of Pharmacy Practice thus making the entire course meaningful and relevant to the profession. Due to interactive nature of the sessions, students agreed that they were provided with opportunities to master various skills such as communication, time-management, teamwork, critical thinking, and problem solving. **Implications:** The presented herein educational model seems to be of considerable interest. However, further study is required to fully assess the validity of this model in pharmacy education.

**Blocked Learning: The Impact of Course Scheduling on Student Exam Performance.** Marcy Hernick, *Appalachian College of Pharmacy*. **Objectives:** To determine the effect of course scheduling on student exam performance. **Method:** Courses with various biochemistry and medicinal chemistry/pharmacology topics in a 3-year Pharm. D. program were taught with 3-6 hours of lecture per day and met 12-30 hours per week. For select topics, students were provided access to optional online modules. Student learning was assessed using course quizzes and/or examinations. **Results:** Students performed best on examinations when topics were taught on 3 hour days, or on 6 hour days for courses not exceeding 12 hours per week (Schedule A, mean = 79.5). Student performance on examinations decreased when the topics were taught in courses scheduled to meet 4-6 hour days and 18-30 hours per week (Schedule B, mean 71.6). Comparison of student performance on quizzes vs. examinations reveals an improvement in performance on examinations vs. quizzes for all topics with Schedule A (n = 10), while an improvement was only observed for 4/9 topics

taught with Schedule B. Additionally, student exam scores exceeded mean module scores for 18/20 topics with Schedule A (underperforming topics down average 3.2 points). The number of topics with underperforming scores increased with Schedule B (11/23), while margin of the decreases rose to average 5.1 points (integrated science/therapeutics courses) and 25.4 (science only courses). **Implications:** Course scheduling has a significant impact on student exam performance. To maximize student learning, courses should be designed to limit the number of direct science hours to not more than 3 hours per day or combined 15 hours per week.

**Discovery of Metal Complexes of Aryl-Monocyclic Polyamines as New Class of Antitrypanosomal Drug Leads.** M. Omar F. Khan, *Marshall University*, Timothy J. Hubin, *Southwestern Oklahoma State University*, Babu L. Tekwani, *The University of Mississippi*. **Objectives:** Human African Trypanosomiasis (HAT), also known as sleeping sickness, is a vector born parasitic disease caused by *Trypanosoma brucei*. Endemic in regions of sub-Saharan Africa, covering 36 countries, the disease affects 350 -500,000 people annually and more than 60 million people are at risk. Toxicity and suboptimal efficacy of current HAT drugs, drug resistance and depleted antitrypanosomal drug discovery pipeline necessitate the discovery of new antitrypanosomal drugs. **Method:** A series of tetraazamacrocyclic derivatives and their metal complexes were synthesized as a part of our ongoing cyclic polyamine-based drug discovery program. Bis-aryl-monocyclic polyamines and mono-aryl-monocyclic polyamines, prepared by standard methods, were screened in vitro against blood stage trypanostigote forms of *T. brucei* at concentrations ranging from 10 to 0.0032  $\mu\text{g}/\text{mL}$  using pentamidine and difluoromethornithine (DFMO) as standard drugs. The compounds were simultaneously tested against African green monkey kidney (Vero) cells for general cytotoxicity. **Results:** Although all the compounds were >100 fold less potent than pentamidine, only 11 of the 44 monocyclic derivatives were about 1.14-2.5-fold less potent than DMFO. The rest of the compounds were equal or several fold more potent than DFMO, the most potent one, which is a bisbenzyl bridged cyclen, being >20-fold more potent (IC<sub>50</sub> 4.12 vs 0.19  $\mu\text{g}/\text{mL}$ ). In general, the bis-aryl-monocyclic polyamine derivatives were more active compared to the monoaryl-monocyclic derivatives. **Implications:** The metal complexes of aryl-monocyclic polyamines represent a new class of antitrypanosomal pharmacophore. Further optimization of these analogs is likely to yield new antitrypanosomal drug leads or alternate medicines for treatment of HAT.

**Investigating the Structural Basis of Partial Agonism at the Dopamine D3 Receptor.** Comfort A. Boateng, *High Point University*. **Objectives:** To understand the structural basis of Partial Agonism at the Dopamine D3 Receptor (D3R) subtype. **Method:** A series of novel full length piperazine derivatives ligands were synthesized by coupling substituted or unsubstituted 1-butyl-4-(2,3-dichlorophenyl)piperazine with quinoline-3-carboxylic acid. In addition, we synthesized synthon sets of enantiomers by reacting 1-(2,3-dichlorophenyl)piperazine with its corresponding epoxides. Their binding affinities were determined using [<sup>3</sup>H]N-methylspiperone radioligand binding in HEK293 cells expressing dopamine D2-like receptors. Followed by functional efficacy studies using a BRET1-based GoA activation functional assay. We further performed comparative molecular dynamics simulations of D3R in complex with these enantiomers. **Results:** We synthesized and characterized enantiomeric pairs of full-length, 2,3-dichlorophenyl piperazine D3R-selective ligands and their synthons. We discovered dramatically different efficacies between the enantiomers, whereby the R-enantiomers displayed antagonism/weak partial agonist, and

the S-enantiomers displayed partial agonism and more efficacious. To further investigate the structural basis of the efficacy switch between the R- and S-enantiomers, we performed comparative molecular dynamics simulations of D3R in complex with these enantiomers. We observed that partial agonists induce common structural rearrangements within the orthosteric binding site (OBS), which may represent an initial step or intermediate state in the activation process. **Implications:** These studies have further extended our understanding of ligand-receptor interactions and the relationship between the OBS and SBP (secondary binding pocket), which leads to both affinity and functional efficacy at the D3R. The results indicated that efficacy is primarily determined by the binding mode of the phenylpiperazine moiety within OBS.

**Synthesis and Pharmacological Evaluation of Halogenated Loperamide Analogs.** Natalie Shrull, *Lipscomb University*, Christopher McCurdy, *University of Florida*, Susan L. Mercer, *Lipscomb University*. **Objectives:** Loperamide, a peripherally-acting mu opioid receptor (MOR) agonist, is a well-known P-glycoprotein (Pgp) substrate. Diphenoxylate, a loperamide analog, is not a Pgp substrate; however, issues with low potency and poor CNS bioavailability surround its use as an analgesic. Our hypothesis is that enhanced MOR potency (loperamide) and diminished Pgp effect (diphenoxylate) can be achieved by exploring hybrid analogs of these two compounds through incorporating the structural features of diphenoxylate into loperamide. A clear distinction between loperamide and diphenoxylate is the presence of a p-Cl substituent on loperamide. This halogenated substitution is of interest towards determination of Pgp binding interactions as no other MOR agonists contain a halogen in this position. **Method:** Halogenated substitution at the 4-phenyl piperidinol was explored. Analogs include R=p-BR (LUCOP 44), R=p-CF<sub>3</sub> (LUCOP 45), R=m-CF<sub>3</sub>, p-Cl (LUCOP 46), and R=H (LUCOP 47). Compounds were submitted for MOR binding and Pgp analysis. **Results:** All halogenated analogs showed increased affinity at MOR relative to loperamide. LUCOP 47 had the lowest K<sub>i</sub> value of 0.0179 nM and bound 125-fold tighter at MOR compared to loperamide. Promega Pgp-GLO results indicate a concentration dependent effect. Efforts are ongoing to further characterize our synthetic analogs using MDCK-Pgp transport and permeability assays. **Implications:** Synthesis of novel MOR agonists that simultaneously maintain MOR potency and are devoid of Pgp activity will allow for chronic dosing as novel analgesics.

**Targeting Topoisomerase II: Synthesis and Evaluation of Halogenated Podophyllotoxin and Etoposide Analogs.** Matthew Murphy, *Lipscomb University*, Joseph E. Deweese, *Lipscomb University*, Susan L. Mercer, *Lipscomb University*. **Objectives:** The anticancer agent etoposide targets topoisomerase II and results in strand breaks that in some patients lead to the development of translocation-induced leukemia. One hypothesis is that metabolites of etoposide are formed preferentially in the myeloid progenitor cells where these translocations occur. Previous studies suggest that halogenation of the C-2' position of etoposide reduces the formation of etoposide metabolites. For this reason, we sought to design and synthesize etoposide analogs that are halogenated at the C-2' position and elucidate its activity against human topoisomerase II. **Method:** Halogens were introduced into the C-2' position by electrophilic aromatic halogenation. The reagents N-bromosuccinimide, N-chlorosuccinimide and tetra-n-butylammonium fluoride afforded a series of desired compounds (LUCOP 48-53) with halogens in the C-2' position. Halogenation reactions were performed on etoposide and the natural products of its derivation, 4'-demethyletoposide and podophyllotoxin. **Results:** Based upon enzyme activity assays with purified human topoisomerase IIa,

LUCOP 48-50 and 52-53 did not increase DNA cleavage. In contrast, LUCOP 51 showed enhancement of topoisomerase II-mediated DNA cleavage in a concentration dependent manner. In addition, LUCOP 48, 49, and 52 showed no significant inhibition of topoisomerase II-mediated DNA relaxation. In contrast to results with DNA cleavage, LUCOP 50, 51, and 53 all display variable ability to inhibit DNA relaxation. **Implications:** The activity observed with these halogenated analogs demonstrates that modifications to the E-ring are tolerated by topoisomerase IIa. These results provide support for complete characterization of the present analogs and synthesis of additional halogenated analogs.

### Theoretical Models

**America's Got Regulatory Science Talent" Competition Inspires Future Innovators.** Andrew Coop, *University of Maryland*, Paul Shapiro, *University of Maryland*, James E. Polli, *University of Maryland*.

**Objectives:** To foster student interest in the science of developing new tools, standards and approaches to assess the safety, efficacy, quality and performance of FDA-regulated products. **Method:** Teams of University of Maryland students representing different undergraduate, professional, and graduate programs collaborate to propose an original solution to a current problem in regulatory science. Students utilize references including the 2014 "FDA Strategic Priorities", and FDA mentors are assigned if requested. A panel of judges from the University and the FDA evaluate each five-minute presentation for novelty, potential significance, and short-term feasibility. **Results:** The annual event attracts 4-7 teams from the two campuses, from freshmen to pharmacy and graduate students. Winning ideas have included placing warning images on medication labels to relay potential harm, streamlining communication between the FDA and drug sponsors during the biomarkers approval process as surrogate endpoints in the Accelerated Approval Pathway, creating an FDA app to communicate safety information and collect medication side effect data from consumers, and using QR codes to access instructional videos for medical devices. Winning teams are invited to present to the FDA's Office of the Chief Scientist. Students have relayed that their involvement in this innovative competition was highly favored during subsequent fellowship/job interviews. Recent pharmacy alums who participated in the competition reported securing FDA employment and postdoctoral fellowships in the pharmaceutical industry. **Implications:** The "America's Got Regulatory Science Talent" Competition enhances the School's relationship with the FDA and builds the pipeline for future regulatory scientists and associates in clinical affairs and pharmacovigilance.

**Communication Breakdown, It's Always the Same! An Academic Chemist and the Mainstream Media.** Andrew Coop, *University of Maryland*, Shannon R. Tucker, *University of Maryland*, Rebecca J. Ceraul, *University of Maryland*.

**Objectives:** To create a toolbox for basic science faculty on effective communication with mainstream media outlets, designed by a faculty member, from the faculty member's point of view. **Method:** Effective communication with the mainstream media is a skill in which basic science faculty members are not traditionally trained, but is essential for promoting both the individual and their institution. Media training is available, but is generally offered from the standpoint of a non-scientist. Thus, the toolbox was designed to translate the training to the science faculty member's vocabulary while emphasizing the best practices essential to communications media training. **Results:** Components of the effective communication toolbox included a high priority on knowing the audience and general tone of the publication (such as the difference between a daily newspaper and a national magazine such as *The Atlantic*), and

ensuring the communication was clear and concise for that audience. In addition, it is essential to utilize active approaches in reaching out to various media outlets, where one article leads to additional articles. Initial quotes on webpages focused on a specialty audience leads to additional requests from other media outlets with a greater and more general audience. **Implications:** This toolbox will aid in the communication of faculty members with the mainstream media, thus raising the profile of both the faculty member and their institution.

### Filling the Pipeline of Science Faculty Through Situated Learning.

Mohammad I. Ansari, *University of Maryland*, Shannon R. Tucker, *University of Maryland*, Andrew Coop, *University of Maryland*.

**Objectives:** To meet the demand for well-qualified science by training of chemistry graduate students and postdoctoral fellows with no prior exposure pharmacy education using situated learning theory. **Method:** Reviewing the "situated" learning opportunities prior chemistry students at the University of Maryland School of Pharmacy (UMSOP) were provided during their transition to faculty positions at schools of pharmacy was used to create a matrix of activities, and contextual knowledge regarding academic pharmacy that supported this transition. The matrix was then evaluated for thematic areas that would systematically encourage and develop students and fellows for academic pharmacy positions. **Results:** Three thematic areas of development were identified as critical components to a successful transition into academic pharmacy. They include: (1) Exposure to Academic Pharmacy - interviews with pharmacists and faculty from other institutions, attendance and presentations at national meetings, pharmacy curriculum expectations through participation in academic and admissions events, and participation in AACP. (2) Developing Teaching Excellence - teaching observation of faculty in various settings, and mentoring by educational technology staff. The creation of educational materials with mentor review. (3) Academic Service - mentoring students, supporting course administration, and observing committees. This evaluation has resulted in a pilot program at UMSOP. **Implications:** By developing an awareness and understanding of academic pharmacy through active and peripheral participation, trainees can develop a passion for pharmacy education and in turn expand the pipeline of future pharmacy faculty. The situated context requires little-to-no implementation cost, but requires close stewardship by a senior mentor(s) and institutional commitment to programmatic success.

### CONTINUING PROFESSIONAL DEVELOPMENT Completed Research

**An Intensive Clinical Pharmacogenomics Course for Pharmacists in Developing Countries.** Christina L. Aquilante, *University of Colorado*, Sherif Kamal, *Children's Cancer Hospital Egypt*, Mohamed Nagy, *Children's Cancer Hospital Egypt*, Jodie V. Malhotra, *University of Colorado*, Kari L. Franson, *University of Colorado*, Manal Zamzam, *Children's Cancer Hospital Egypt*, Sherif Abouelnaga, *Children's Cancer Hospital Egypt*.

**Objectives:** Pharmacists are uniquely qualified to clinically apply pharmacogenomics. However, many pharmacists, particularly those in developing countries, have not received formal pharmacogenomics education. Our objective was to develop an intensive, practice-based, clinical pharmacogenomics course for pharmacists in Egypt. **Method:** The University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences (CUSSPPS) and Children's Cancer Hospital Egypt (CCHHE) partnered to develop a 5-day, live course taught by a clinical pharmacogenomicist from CUSSPPS. The course consisted of 28.5 hours of ACPE-accredited,



practice-based, continuing education and a certificate upon completion. The course consisted of 12 didactic lectures, 10 case-based exercises, one journal club, and one clinical implementation activity. The program targeted elements of the ASHP Statement on the Pharmacist's Role in Clinical Pharmacogenomics and consensus-based pharmacist-specific pharmacogenomic competencies. **Results:** The course was offered January 2017 at CCHE. Ninety participants attended, the majority being practicing pharmacists. Knowledge was assessed via a 30 multiple-choice question pre- and post-test. Of participants who took both assessments (n=57), the pre-test mean  $\pm$  SD (range) was 35.3%  $\pm$  20.5% (0-80%) and the post-test mean  $\pm$  SD (range) was 87.1%  $\pm$  12.8% (50-100%),  $p < 0.0001$ . 95.5% of participants rated "extent to which this course will change your way of thinking at your work setting" as excellent or good. 96.7% of participants reported they would recommend this course to colleagues. **Implications:** Our international partnership highlights an effective strategy to rapidly educate pharmacists with practice-based pharmacogenomics knowledge. It also sets the stage for the launch of a Personalized Medication Management Service at CCHE.

**Assessing Pharmacy Educator's Ability to Reliably Assign Bloom's Taxonomy Categories to Their Exam Questions.** Emily Chan, *Touro University California*, Mitchell Barnett, *Touro University California*, Eric Ip, *Touro University California*. **Objectives:** To examine the reliability of assigning exam questions into a Bloom's taxonomy category. **Method:** A convenience sample of 100 exam questions was chosen to represent a broad sample of rank and department from question writers. The actual question was masked during sampling to ensure a measure of randomness. All questions were selected from Fall 2016 semester 1st- and 2nd- year core didactic courses. The Bloom's category assigned by the question writer was compared to the category assigned by one of three external reviewers using a numeric ranking (1=Knowledge, 2=Comprehension, 3=Application, 4 = Analysis, 5 = Synthesis, 6 = Evaluation). **Results:** Numerically lower Bloom's classifications were observed for question authors relative to external reviewers ( $1.7 \pm 1.1$  vs  $2.1 \pm 1.4$ ,  $p = 0.003$ ). Overall, moderate inter-rater agreement ( $r = 0.56$  to  $0.68$ ) was seen between the external reviewers and question writers, as well as between the three external reviewers ( $r = 0.67$  to  $0.91$ ). Stratified results by academic rank or department of the question writer did not reveal any obvious patterns. **Implications:** While incorporating critical thinking skills into pharmacy education has been universally supported, measurement of these skills has been involving. Furthermore, limited research has been done to examine reliability of classification with the widely used Bloom's taxonomy. Based on our results, despite some overall agreement on critical thinking classifications, there appears to be some significant disagreement between question writers and external reviewers regarding the proper classification. Pharmacy administrators may wish to provide training to faculty to enhance the reliability of critical thinking classifications.

**Enhancement of Co-Curricular Activities and Barriers for Preceptor Involvement.** Roberto W. Linares, *Oregon State University*, Ann Zweber, *Oregon State University*, Shannon Starwalt, *Oregon State University*, Emma Redwin-Hixson, *Oregon State University*. **Objectives:** To enhance the education of students during their co-curricular learning, the College of Pharmacy surveyed local area preceptors who are involved in overseeing students during experiential learning and community outreach. The goal of the survey was to identify level of interest in participating in co-curricular activities and what type of development was desired. The survey was followed up with a professional development event. **Method:** A survey was delivered to

pharmacies in the three communities closest to the College where most IPPE activities occur. The survey asked about experiences with precepting outreach events, and interest in participating in a CE event focused on precepting student outreaches. **Results:** Fifty-two pharmacists completed the surveys. Thirty nine (75%) indicated they had not precepted a student outreach event in the past year. The most common reasons for not precepting events included having other plans on the day of the event, not given enough notice, and not being asked. Other concerns included not having enough information. Thirty-seven (71%) indicated they would be somewhat to very interested in attending live training focused on precepting outreaches. **Implications:** The survey indicated preceptors in the area who have not recently been involved in student outreach events, and barriers to involvement. The survey results helped guide the College's development of a preceptor training CE to improve awareness and address preceptor barriers. Additional efforts to improve communication with outreach preceptors is ongoing.

**Habits and Attitudes of Graduates Regarding Continuing Professional Development.** Christopher Gore, *Union University*, Lauren Peyton, *Union University*, Andrew Martin, *Union University*, Mark A. Stephens, *Union University*. **Objectives:** To characterize the habits and attitudes of pharmacy school graduates regarding continuing professional development (CPD). **Method:** A 19-question survey was emailed to 2012 – 2015 Union University pharmacy graduates. The survey inquired about methods used by graduates to remain current on pharmacy topics; familiarity with 16 recent landmark trials, guidelines, and other news-worthy topics in the literature; and awareness and utilization of the four components of CPD. **Results:** Of the 183 alumni surveyed, 58 (32%) completed the questionnaire. Slightly more respondents (48%) practiced in community pharmacy compared to institutional pharmacy (41%). One-third completed post-graduate training, and 14% had achieved a board certification. Eight-two percent of respondents spend at least 30 minutes per week reading to stay current with 20% spending more than two hours. News (84%), professional association (58%), and government (58%) publications were utilized most frequently; social media was used by at least 28% of graduates. Familiarity with the 16 current pharmacy topics in the survey varied widely from 32-96%. The majority of respondents (84%) were unfamiliar with the formal CPD concept. However, 78% reflected on their personal learning needs. Only 28% developed a learning plan, but 38% stated they acted on their personal learning plan. Few alumni evaluated their learning plan and the impact of completed activities. **Implications:** Most alumni seek to keep current but are unfamiliar with CPD. However, components of CPD are practiced. Schools may need to identify areas of the curriculum where student self-reflection, with an emphasis on CPD, can be enhanced.

**Impact of Improving Online Learning Methods in an Online Team-Based Learning(TBL) Interprofessional Education (IPE) Course.** Colleen A. Catalano, *University of Colorado*, Shaun E. Gleason, *University of Colorado*, Lisha Bustos, *University of Colorado*. **Objectives:** To describe the impact on student learning and perceptions in an online TBL-delivered IPE course after implementing improved online education methods **Method:** The course, delivered over 2 semesters to year1-2 PharmD, nursing and MD/PhD students, is modelled after concurrent face-to-face(F2F) sections of same course, and contains 16 online modules on three content domains (teamwork/collaboration, values/ethics, and safety/quality). In 2015, online course activities were designed to closely "mimic" F2F application activities. In 2016, we aimed to diverge from "mimicking" F2F, while achieving the same learning outcomes as F2F using modified online learning strategies. Modifications were designed to improve course

collaboration methods (eg, use of wiki-type documents and teleconferencing; reduced threaded discussions) and streamline application exercises. We compared student learning data [individual readiness assurance tests (iRATs) and final exams], and perception data (session evaluations assessing perceptions of knowledge- and application-based learning and teamwork, and final course evaluations assessing overall course perception) from the two semesters of each cohort, 2015 and 2016. **Results:** Students: N= 57-79(2015); 85-88(2016). Mean iRAT/final exam scores: 84.7/84.6(2015), 87.9/85.0(2016). Mean session scores on knowledge- and application-based learning, and teamwork: mean 3.31(2015), mean 3.65(2016); overall course evaluation scores (mean of means) 3.14(2015), 3.55 (2016). Comfort with TBL process(week): 3.94(2015), 2.8(2016). **Implications:** Modifications to improve online learning strategies in an online TBL IPE course maintained learning, and improved perceptions on course learning activities and teamwork. Changes also led to earlier comfort with the online TBL process, we believe allowing our students to focus on interprofessional, collaborative learning. These program evaluation data are not generalizable.

#### **Role for Pharmacist Educators in an Interprofessional MS Palliative Care(MSPC) Program: Informed by Student Perceptions.**

Shaun E. Gleason, *University of Colorado*, F. Amos Bailey, *University of Colorado School of Medicine*, Regina M. Fink, *University of Colorado College of Nursing & School of Medicine*. **Objectives:** To inform the role for pharmacy educators in an interprofessional MSPC program through assessment of student learning and perception data. **Method:** We deliver the 36 credit-hour MSPC program interprofessionally and online with three brief live sessions. Faculty/course content come primarily from nursing, medicine, bioethics, social work, spiritual care, psychology, and communication disciplines. Pharmacy's role initially one of planning/review; role is growing. We assessed student learning and perception through first-semester course grades and evaluations. Self-assessments on 39 palliative care(PC) skills/tasks at program start also measured perception. We categorized questions as medication management, assessment/management of PC conditions, social/ethical/communications. Replies were assigned values 1-5: 1="need basic instruction," 3="feel competent to perform with minimal supervision," and 5="am competent to perform independently and teach others." **Results:** The inaugural(2016-17) cohort= 16 students: pharmacist(n=1), nurses(n=8BS,1DNP), physician assistants(n=4), physicians(n=2). Two courses were delivered fall 2016 semester. Student learning: mean GPA=3.98/4.0 Course evaluation scores: mean 3.88/4 (n=6 questions; 6-7 respondents; 4=highly rated) PC self-assessment questions: mean=3.01. Questions with means </=3: 4/5 medication management (range=2.63-3), 4/7 assessment/management of PC conditions (range=2.31-2.94), 10/27 social/ethical/communications (range=2.31-3). **Implications:** Although first-semester data indicate students performed well and perceived courses highly, baseline PC self-assessment results indicate our interprofessional students feel less competent in skills on medication management and assessment/management of PC conditions. We believe this indicates a greater need for pharmacy educators in our program. Therefore, we increased pharmacy's curricular presence, implementing a "pharmacy pearl" (discussion of interesting/important issues) thread, and participation in key lesson development. Assessments are ongoing. These program evaluation data are not generalizable.

**Third-Year Pharmacy Student Self-Awareness of Practice Readiness.** Peter J. Hughes, *Samford University*, Michael G. Kendrach, *Samford University*, John J. Arnold, *Samford University*. **Objectives:** Gauge third-year (P3) pharmacy student attitude regarding practice

preparedness following an assessment mapped to the current NAPLEX® blueprint. **Method:** A 25-item formative assessment consisting of multiple choice questions was prepared and administered electronically to 6 small groups of P3 students during the first week of a required spring semester session. Students received immediate grading and feedback. Facilitated discussion on items that received low proportions of correct answers was conducted. A follow-up e-survey consisting of 12 items was distributed to all students to determine perception of foundational knowledge retention, activity usefulness, and anticipated study plans. This project received IRB approval. **Results:** The perception survey was completed by 77/110 students (70.6% response rate). Results indicate 64 respondents (91.7%) agreed that completing this assessment exposed areas of strengths and weaknesses, especially with respect to information and knowledge retention. Additionally, 93.5% agreed that the activity was useful, but only 37% of respondents performed to their expectation on the assessment. Upon reflection, 55.8% agreed that they had not considered how they would prepare for NAPLEX® before completing the assessment and 74% agreed that performance on the exercise will spur them to develop a NAPLEX® study strategy sooner than initially expected. **Implications:** Third-year pharmacy students agreed this assessment helped them gauge their practice readiness. The school has scheduled additional sessions to assist P3 student knowledge retention and recall for advanced pharmacy practice experience and licensure examination preparation.

#### **Theoretical Models**

**An Introductory Approach to Integrating Leadership and Professionalism Into Pharmacy Curriculum.** Kerry K. Fierke, *University of Minnesota*, Gardner A. Lepp, *University of Minnesota*, Forrest Batz, *University of Hawaii at Hilo*. **Objectives:** To explore preparing university faculty to incorporate leadership and professionalism in their courses and support pharmacy faculty to address ACPE accreditation standards. **Method:** Two colleges of pharmacy partnered to provide a one-day, interactive workshop with foundational theories, strategies, and tactics to help faculty develop leadership and professionalism skills among university students, including student pharmacists. Faculty were provided with, and practiced applying, evidence-based knowledge and interactive tools specific to building leadership and professionalism. **Results:** Twenty-two participants from across seven university disciplines attended the workshop, including ten from pharmacy. A post-evaluation, including six scaled evaluative statements and two open comment questions, was conducted immediately after the workshop and again ten days later. One hundred percent of respondents rated each of the scaled questions 'strongly agree' or 'agree', including the statement, "I will implement something (content, tool, or method) I saw/learned at the workshop." Evaluation comments indicated that attendees found the workshop personally and professionally relevant and several had immediately incorporated aspects of their workshop into their current teaching. **Implications:** Targeted professional development sessions are one practical approach to providing faculty with the knowledge and tools to address leadership and professionalism in the classroom. This foundational step may provide support for pharmacy faculty to address ACPE accreditation standards related to development of leadership and professionalism.

**Developing an Interprofessional Curriculum for Safe Handling and Preparation of Sterile Hazardous Drugs.** James W. Torr, *Lipscomb University*, Amanda Gibbs, *Lipscomb University*, Matthew Hoak, *Lipscomb University*, Elyse Prather, *Lipscomb University*.

**Objectives:** Healthcare workers who practice in areas where sterile hazardous drugs (HDs) are prepared or administered are at risk for occupational exposure to these agents. A needs assessment identified a gap in training related to the safe handling and preparation of sterile HDs. The program goal was to develop an interprofessional continuing education curriculum targeting pharmacists, technicians, and nurses in outpatient oncology clinics. Curriculum objectives included: (1) describe risks of occupational exposure to HDs; (2) identify routes of exposure to HDs; (3) identify controls for reducing exposure to HDs; (4) demonstrate appropriate use of controls to prepare a simulated compounded sterile HD preparation. **Method:** To guide development of the continuing education program, a systematic review of published curricula was conducted. The literature search utilized multiple databases (PubMed, CINAHL, and ERIC) and educational journals. The following educational strategies were identified for the curriculum: (1) assigned readings; (2) didactic lectures (webinar); and (3) laboratory exercises (i.e. simulated compounding sterile HDs). **Results:** The systematic literature review yielded no results for interprofessional curricula related to the safe handling and preparation of sterile HDs. Program data is currently being evaluated to guide development of future curricula. **Implications:** Additional training may improve compliance with controls and reduced risk of occupational exposure to sterile HDs. Due to the absence of published applicable curricular models, this program would provide valuable insight towards the development of future curricula. Since exposure to sterile HDs in healthcare settings potentially impacts multiple disciplines, such curricula presents an ideal opportunity for developing interprofessional education models.

## EXPERIENTIAL EDUCATION Completed Research

**A Multi-School Evaluation of Academic Success Plans During Advanced Pharmacy Practice Experiences (APPEs).** Lindsey H. Welch, *The University of Georgia*, C. Lea Bonner, *Mercer University*, Jill M. Augustine, *Mercer University*. **Objectives:** To quantify and evaluate the impact of academic success plans (ASPs) assigned by the Offices of Experiential Education (OEE) at two pharmacy schools across two academic years. **Method:** ASPs encouraged reflection on APPE performance to achieve student-driven improvement. ASPs were assigned to students who had either a “needs development” or lower documented by preceptors for the same learning objective during more than one APPE and/or poor overall performance as determined by the OEE. Average scores were calculated by assigning point values to each assessment score (Exceeds Expectations=1; Competent=0; Needs Development, Needs Significant Development, Remediation Required=-1). Data were analyzed using STATA SE, 14. **Results:** Ninety-two ASPs were assigned to 67 students during academic years 2014-2015 and 2015-2016. Eighteen students were assigned two to four ASPs during the APPE curriculum. ASPs were most frequently assigned because of poor student performance in one or more learning outcomes related to developing, implementing and monitoring drug therapy plans (n=56), critical thinking and problem solving skills (n=51), and drug therapy plan assessment (n=42). Acute medicine experiences were most associated with the assignment of an ASP (74%). Among students who completed at least one ASP, average scores improved in all learning outcomes when comparing pre- and post-ASP scores (pre-score=0.32 vs post-score=0.48, p<0.001). **Implications:** Prior to 2015, OEE interventions were triggered by APPE mid-point and/or final grades earned, not necessarily achievement of specific learning objectives. ASPs were

successful in catalyzing student reflection and APPE performance improvement.

**A Multi-School Evaluation of Interprofessional Interactions During Health-Systems-Based Advanced Pharmacy Practice Experiences (APPEs).** Lindsey H. Welch, *The University of Georgia*, Jennifer Danielson, *University of Washington*, Lori J. Duke, *The University of Georgia*. **Objectives:** To quantify and evaluate interprofessional collaborations which occur during APPEs based in health-systems at two pharmacy schools across an academic year. **Method:** During end-of-APPE evaluations, students completed questions about the frequency and scope of interprofessional interactions which occurred during each experience. Questions also targeted level of integration with the team and amount of shared accountability for patient outcomes. Health-systems-based APPEs were categorized as General Medicine and Inpatient (general institutional and subspecialty experiences). Community, outpatient, and non-patient care APPEs in this setting were excluded. Data was continuously collected over a 12-month period and analyzed using Excel. **Results:** Results from 245 students (100% response) were collected for a total of 1020 health-system-based rotation experiences between May 2015 and May 2016. The most frequent daily interactions occurred with nurses (n=709) and physicians (n=629). The highest level of interaction (patient care decision-making) occurred most often with physicians (31.5%). The majority of students reported having either full (41.2%) or partial (45.3%) accountability for patient outcomes and the most commonly described role on the interprofessional team was active participation (51%). 88% agreed or strongly agreed that these rotations provided meaningful interactions with other healthcare professionals. **Implications:** IPE in the health-systems setting is generally an assumed occurrence. While data from these two schools showed that the majority of students report frequent, high-quality IPE during APPEs based in health-systems, inequalities exist. This assessment highlights the need for IPE tracking which may assist with targeted preceptor development to enhance interprofessional opportunities and depth of interactions.

**A Novel Interprofessional IPPE Experience in a Liberal Arts University.** Sara Trovinger, *Manchester University*, Walter T. Smith, *Manchester University*, Ahmed Abdelmageed, *Manchester University*. **Objectives:** For programs that do not have additional health sciences programs within their institutions, finding patient-centered interprofessional IPPE opportunities can be challenging. This research aims to outline a unique approach to provide IPPE hours to students in an interprofessional environment. **Method:** Manchester partnered with four clinics in the Fort Wayne, IN area that rely on volunteer health professionals, including students, and provide care for uninsured or underinsured patients. Students in their second and third professional years were assigned to a clinic and required to participate in one four-hour direct patient-care experience per semester as part of an interprofessional team generally comprised of a nurse and prescriber, and then complete a reflection responding to given prompts. All reflections were uploaded to our learning management system and reviewed via a standard rubric with a maximum score being 16, with 12 points devoted to their professional growth as part of an interprofessional team, and 4 points devoted to writing mechanics. **Results:** All students completed their four required IPPE hours during the Fall 2016 semester. The mean of all student rubric scores was 14.23 with a standard deviation of 2.19. The results indicate that the majority of students were able to reflect on their role, the value of pharmacists as part of an interprofessional team, and how this experience related to their educational/career goals. **Implications:** This model could be used as a framework for other liberal arts universities to provide

interprofessional IPPE experiences for their students without their university having other healthcare majors/professional programs.

**A Practical Tool to Assess Interprofessional Activities During Advanced Pharmacy Practice Experiences.** Veronica S. Young, *The University of Texas at Austin*, Jennifer L. Ridings-Myhra, *The University of Texas at Austin*, James N. Barnes, *The University of Texas at Austin*. **Objectives:** Preparing PharmD students to provide patient-centered care as a contributing member of an interprofessional team is the hallmark of ACPE Standard 11. Conducting baseline and ongoing assessments of APPE interprofessional activities is essential in identifying best practices, analyzing gaps, and guiding programmatic requirements. An assessment tool must take into consideration student survey fatigue and quality of responses. Since there is no universally-recognized instrument, the objective of this process improvement project is to develop and pilot a low burden student assessment tool to determine the extent of interprofessional experiences during APPEs. **Method:** Criteria for APPE interprofessional activities were previously approved. A 4-item survey was developed internally and beta-tested by students. The tool was piloted by APPE students across six regional campuses. Further tool refinement was guided by focus group responses and suggestions from subcommittees and experiential personnel. **Results:** Forty-one students participated. Students reported interprofessional experiences across all rotation categories, with team-based care most common on medicine rotations. Students most likely interacted with physicians, medical students, nurses, and social workers. Types of experiences varied by practice sites. Preceptor expectation of student involvement in interprofessional activities were not always clear. The analysis identified gaps where interprofessional activities were lacking. Students felt survey completion was not a burden and made recommendations on implementation. **Implications:** This tool effectively collected essential data to evaluate the extent of APPE interprofessional activities for rotation and programmatic assessment without adding to student burden. It is designed to complement other IPE assessments being developed, including guided self-reflections and preceptor evaluations of interprofessional competencies.

**A Preceptor-Led Topic Discussion Designed to Articulate a Study Abroad Experience in an Interview.** Monica L. Miller, *Purdue University*, Ellen M. Schellhase, *Purdue University*, Rakhi Karwa, *Purdue University*, Susie J. Crowe, *East Tennessee State University*. **Objectives:** Purdue University College of Pharmacy (PUCOP) hosts a global health advanced pharmacy practice experience (GH-APPE) in Kenya. Historically students have struggled to summarize their professional development into concise, articulate responses when asked about this experience during interviews. This project aimed to strengthen students' confidence and ability to create articulate responses about the skill set developed while in Kenya during interviews. **Method:** A preceptor-lead topic discussion was developed to allow students opportunities to articulate their GH-APPE experience as answers to commonly asked interview questions. One month after graduation, students in two graduating classes were asked to complete a 19-question online survey to assess the activity's impact on their ability to articulate interview answers. A 5-point Likert scale was used for most questions. Demographics were collected. The Purdue University institutional review board approved this study. **Results:** Twenty-four (65%) students completed the activity assessment survey. The students reported participation in a total of 97 interviews and 73% of interviews asked about Kenya. Eighteen respondents "strongly agreed" they were able to apply their experience in Kenya to typical interview questions. The majority (23) of respondents, either "strongly agreed" or "agreed" that the topic discussion prepared them to defer questions away from

the topic of safari. Seventy five percent "strongly agreed" that the topic discussion should be continued for future students. **Implications:** Students felt more comfortable crafting articulate answers to questions about professional skills after the interview preparation discussion. Future plans include expanding this topic discussion to include other GH-APPE experiences offered at PUCOP.

**A Qualitative Study to Identify and Standardize Key Components Across Inpatient General Medicine APPE Sites.** Teresa A. O'Sullivan, *University of Washington*, Erin Sy, *University of Washington*. **Objectives:** To identify common components of inpatient general medicine advanced pharmacy practice experiences (APPEs) across sites, determine which components are important to standardize, and distinguish a benchmark for each component indicating standardization. **Method:** In-depth interviews about the student experience were conducted with two students and one or more preceptors at each of 12 inpatient general medicine sites in the greater metropolitan area. Content analysis of transcribed interviews was performed to identify overarching themes and components within each theme. Components important for quality of the student learning experience were deemed "key components" and component metrics were developed for benchmarking across sites. **Results:** Three themes were essential in the quality of the learning experience at inpatient general medicine sites: welcoming of the student by the preceptors, integration of the student into the site, and student interaction with patients and other health care providers. Key components to standardize across sites are a structured orientation, written site-specific student performance expectations, regular and meaningful student-preceptor interactions, identified performance competency standards, clear delineation of student patient care load and responsibilities, and daily interactions with patients and with other health care providers. **Implications:** Qualitative evidence from sites can be used to identify key components to standardize across practice sites offering the same experiential course. In the inpatient general medicine environment, key components aid in the welcoming of the student to the site, integration of the student into the workflow, and daily opportunities for students to have meaningful interactions with patients and with other healthcare providers.

**An Innovative Process for Systematic Review of Experiential Courses and Site Visits.** Renu F. Singh, *University of California, San Diego*, Kelly C. Lee, *University of California, San Diego*, Sarah Lorentz, *University of California, San Diego*, Joseph Ma, *University of California, San Diego*, James Colbert, *University of California, San Diego*, Nathan A. Painter, *University of California, San Diego*, Rabia Atayee, *University of California, San Diego*, Eduardo Fricovsky, *University of California, San Diego*, Jennifer Le, *University of California San Diego*. **Objectives:** A faculty committee led a course and site review of experiential courses to ensure quality, consistency and adherence to ACPE Standards 2016. The objectives were to develop a systematic process for course review. **Method:** A six-member committee composed of clinical faculty reviewed existing Advanced Pharmacy Practice Experiences (APPE) syllabi and student course evaluations. A course assessment tool was created that incorporated student evaluations, course syllabus, orientation process, review of expectations, and evidence of inter-professional education. Course review and site visits were scheduled with prioritization given to sites having educational partnerships with the school, frequently used rotations, and sites identified as having challenges. A target of two reviews were conducted monthly, with monthly committee meetings. Following committee discussion, sites received written requests for clarifications, changes or notification of next review in 3-5 years. **Results:** Thirteen health-systems have been reviewed to date, encompassing

77 (82%) core and elective APPEs. Common reviewer recommendations included updating course syllabi to add key components of ACPE Standard 13, updating rotation expectations, and providing diverse patient care opportunities. Site coordinators appreciated the visits and the opportunity to meet with faculty, obtain suggestions on how to improve their experiences for students, and provide feedback on areas of enhanced student preparation for rotations. Follow-up letters were sent to site preceptors, with the majority responding to recommendations to date. **Implications:** A faculty-directed committee using a systematic course review process is an effective way to conduct experiential course assessment. Challenges include significant time and resources needed for the review process.

**Are Your Students Hearing or Doing: A Technique for Monitoring Active Learning Engagement During IPPEs.** Stanley S. Weber, *University of Washington*, Curtis G. Jefferson, *University of Washington*, Kelsey Brantner, *University of Washington*. **Objectives:** Situated learning, the opportunity to learn skills in actual practice settings where they are applied, is an important component of experiential education. In order to both understand and increase the chance for students to engage in situated learning during IPPEs, we have used a “Hear See Do” continuum rubric to calculate a score representing the extent to which the experience allowed them to “do” each associated task. A parallel rubric quantifies how prepared students believe they were to complete specific tasks. **Method:** “Hear See Do” and “Preparedness” scores for each IPPE from 5 consecutive PharmD classes were analyzed to examine changes in students’ experiences over time. **Results:** For community IPPEs, the mean “Hear See Do” score remained high (4.41; Hearing = 1, Doing = 5) and did not change significantly over 5 years. The “doing” of 2 and “preparedness” of 4 of 12 specific tasks increased; none decreased. For institutional IPPEs, the mean “Hear See Do” score was 4.19 and decreased over 5 years ( $p < 0.001$ ). The “doing” of 2 and “preparedness” of none of 18 specific tasks increased, while the “doing” of 9 and “preparedness” of 2 of 18 specific tasks decreased. **Implications:** Using data from “Hear See Do” rubric allows us to examine student engagement in specific IPPE tasks. The institutional IPPE appears to be providing fewer opportunities for situated learning. As we can determine these results by specific institutions in which students are placed, we are able to follow up with sites directly as part of our quality assurance process.

**Assessing Pharmacy Students’ Exposure and Reflections About Interprofessional Collaboration During Introductory Pharmacy Practice Experiences.** Maggie Ramirez, *The University of Kansas*, Sarah Shrader, *The University of Kansas*, Ashley Crowl, *The University of Kansas*, Brianna Long, *The University of Kansas*, Crystal Burkhardt, *The University of Kansas*. **Objectives:** To meet pharmacy accreditation standards, the introductory pharmacy practice experience (IPPE) curriculum at the University of Kansas was revised to require reflections of students’ exposure to and perception of interprofessional collaboration (IPC). **Method:** Pharmacy students submitted reflections after their community or institutional IPPE. The de-identified reflections were analyzed through deductive content analysis to identify students’ perceptions about IPC in each setting. A coding system was developed by a subject matter expert before analysis. Eighteen codes describing roles and responsibilities, teamwork, and communication observed in the institutional pharmacy reflections and thirteen codes describing barriers or opportunities in the community pharmacy reflections were applied to the data. Student investigators used the codes to identify the most prevalent themes using Dedoose® software. **Results:** All 98 institutional pharmacy reflections referenced at least one observed interprofessional encounter. Identified themes

from institutional IPPE reflections recognized mutual respect, role overlap, teamwork, non-physician leadership, relationships, dysfunctional communication, and technology affecting IPC. Observed interprofessional encounters were referenced in 51% of the 130 community pharmacy reflections. Identified themes from community IPPE reflections recognized access to patient health data, direct access to prescribers, hierarchy, pharmacy workload, and timely communication as IPC barriers. IPC opportunities were extended clinical pharmacy services, networking and relationships, phone calls, and technology. **Implications:** Implementing student reflections during IPPEs was effective for collecting student exposure to IPC, and noted their perceived value of IPC and recognition that challenges related to IPC exist in both pharmacy practice settings. Reflections provided information for future preceptor development to enhance interprofessional education in practice.

**Assessment of Interprofessional Team Care During Advanced Pharmacy Practice Experiences.** William P. Wynn, *South University*, Alyssa Norwood, *South University*, Richard O’Brocta, *South University*. **Objectives:** To utilize retrospective assessment data to assure that students gain an in-depth experience in delivering direct patient care as part of an interprofessional team. In addition we will analyze how well the preceptor and student self-evaluations agree as related to interprofessional team care. **Method:** Data from the first two APPE time frames beginning September 2016 were utilized. The final preceptor evaluation of the student and the student self-evaluation relating to interprofessional team-care was captured and analyzed. Class size is 135 and only core rotations were evaluated. **Results:** Final Likert score of the preceptor evaluation of the student and student self-evaluation matched 78% of the time; no grade was greater than 1 Likert score different. 83% of the time the preceptor scored the student higher than the student. Comparing five learning interprofessional team related outcomes per rotation, 79% of the time both students and preceptors agree a learning outcome was achieved. When there was a variance, 54% of the time preceptors indicated the student achieved the outcome and the student indicated they did not. 46% of the time students indicated they achieved the outcome and the preceptors indicated they did not. **Implications:** The results will help us identify areas of weakness and make changes to our program to better assure students gain an in-depth experience as part of an interprofessional team.

**Assessment of the Department of Defense (DOD) Innovative Readiness Training (IRT) Program for Co-Curricular Activities.** Chad K. Kawakami, *University of Hawaii at Hilo*, Lara Gomez, *University of Hawaii at Hilo*. **Objectives:** To determine if the activities pharmacy students participated in, during Innovative Readiness Training (IRT), a US military program that provides training and readiness for military personnel, can be mapped to the college’s co-curricular areas and general learning outcomes. **Method:** Ten students ranging from post P1 to post P3 volunteered to participate in Tropic Care 2016, an IRT mission, assisting Army pharmacy officers in the operation of a pharmacy under field conditions. Activities included prescription processing, filling, and medication counseling. Prescriptions were manually recorded on an Excel spreadsheet for record keeping, then manually filled. This included handwriting a prescription label in accordance with applicable state law. Students also gained experience providing medication counseling to all patients at pick up. These activities were compared against the co-curricular areas and general learning outcomes. **Results:** Student engagement in Tropic Care satisfied DKICP’s co-curricular requirements in areas related to patient consultation, educational outreach, and student leadership, as well as CAPE outcomes Domain 3 – Approach to Practice and Care and Domain 4 – Personal and

Professional Development. **Implications:** The Department of Defense conducts IRT in multiple states across the United States providing unique opportunities for pharmacy students to participate in real-world military missions while satisfying CAPE and ACPE requirements for co-curricular activities. Additionally, students were exposed to health-care delivery by military providers, which may generate interest in military service. In the future, we plan to integrate pharmacy and nursing students in the planning and execution of Tropic Care providing an interprofessional education activity.

**Building a Better Preceptor: Qualitative Analysis of Pharmacy Student Student Feedback of Preceptors Across Three Cohorts.** Laura Broughton, *University of Kentucky*, John Blaine, *University of Kentucky*, Anne Policastri, *University of Kentucky*. **Objectives:** Preceptors for the University of Kentucky College of Pharmacy consistently rank high on assessments from students. Rotation comments were examined to determine key rotation qualities and experiences that set an exemplary preceptor apart from a good preceptor. **Method:** Three cohorts were chosen for analysis: the classes of 2014, 2015, and 2016. There were 1,916 total final evaluation surveys that met the inclusion criteria of student experiences in the four required rotation types. Free text response components of the surveys were reviewed using thematic analysis by three coders for emerging negative and positive themes. Those results were then stratified by frequency of the theme's appearance in the evaluations. **Results:** Across all three cohort years, the three most common weaknesses on rotations were: lack of a formal and adequate orientation to the site, lack of role/expectation setting from the primary preceptor for the student that was understood by the student and all additional staff, and lack of consistent and frequent feedback from the primary preceptor across the six weeks of the APPE rotation. These themes were also recognized in positive feedback when they were present at the rotation, further demonstrating student value of these rotation components. **Implications:** Training will be provided for preceptors through continuing education to help them revise orientation components surrounding site orientation and role expectations. A more descriptive feedback tool has been developed for use by preceptors and available in their course shell to assist in providing more consistent and meaningful feedback to their students.

**Comparison of Pharmacy Students' Perceptions About Collaborative Practice Before and After an Interprofessional Shadowing Experience.** Kim A. Lindsey-Goodrich, *Union University*, Sean R. King, *Union University*. **Objectives:** The purpose of this study was to evaluate whether an interprofessional practice shadowing experience during the first year of pharmacy school would affect entry-level pharmacy students' perceptions and attitudes regarding interprofessional team practice. **Method:** An interprofessional learning activity was incorporated in the Community Introductory Pharmacy Practice Experience (IPPE) where first year pharmacy students completed a three-hour shadow experience at the Living in a Fit Tennessee (LIFT) Center in Jackson, Tennessee; here they shadowed a nurse, dietitian and social worker. Second year students did not complete this activity and served as the control group, however, they may have been exposed to interprofessional interactions on their IPPE rotations or in didactic course work. Both student groups were asked to complete the Readiness for Interprofessional Learning Scale (RIPLS) questionnaire one week before and one week after the shadow experience. The student groups were compared on demographics and the impact of the intervention was assessed. **Results:** First year (n=45) and second year (n=52) students who completed the RIPLS surveys did not differ in demographic variables. There was a significant difference at pretest in

previous experience in interprofessional teaching ( $p=0.000$ ). Analysis of covariance (ANCOVA) revealed a significant difference between groups on readiness for interprofessional learning at posttest ( $p=0.005$ ). **Implications:** The findings of this investigation indicate that real-world shadow experiences may be a valuable tool to influence perceptions and attitudes of interprofessional practice for entry-level pharmacy students. These results may assist other schools of pharmacy in their efforts to incorporate interprofessional education into their curricula.

**Comparison of Preceptor and Student Perceptions of Interprofessional Activities and Level of Engagement on Required APPEs.** Lisa M. Meny, *Ferris State University*, Lisa A. Salvati, *Ferris State University*. **Objectives:** Do students and preceptors at Ferris State University College of Pharmacy document their interprofessional interactions and rate their level of engagement with healthcare team members comparably on required APPEs? **Method:** A baseline inventory was conducted in March 2015 by an online survey distributed to preceptors to assess prescribers and non-prescribers students collaborate with on their APPE. Preceptors were also asked to rate their students level of engagement during interprofessional activities as not applicable, observe or active participation. Beginning in May 2016, students were asked at the end of their APPE the same questions obtained from preceptors. Data was included for analysis if a student matched with a preceptor who completed the initial inventory. Data was analyzed utilizing McNemar's test and descriptive statistics. **Results:** 30 preceptors completed the initial inventory (40% faculty, 60% volunteer preceptors). 132 student evaluations were included in the analysis. A low percentage of students indicated they interacted with the same prescribers and non-prescribers compared to their preceptors (19% and 15%, respectively). 11% of the time students recognized the same interprofessional activities as their preceptors. Students and preceptors differed on their interpretation of active participation during interprofessional rounding ( $p=0.02$ ) and discharge education ( $p=0.0082$ ). **Implications:** Students and preceptors differ in their perception on the health professionals they are interacting with in the experiential setting. This data provides guidance for future professional development for preceptors. It is important for students to be able to identify interprofessional practice that is occurring and the pharmacist's role on the health care team.

**Conducting a Needs Assessment for the Preceptor Development Program at the Leslie Dan Faculty of Pharmacy.** Lalitha Raman-Wilms, *University of Toronto*. **Objectives:** To enhance the Preceptor Development Program (PDP) currently offered, a number of opportunities were under consideration. Prior to developing and offering addition modules, the Faculty sought input from current preceptors and students to determine the learning needs of preceptors and their preferred mode of learning. **Method:** Anonymous online surveys were sent to preceptors and students. Focus groups and semi-structured interviews were conducted with key stakeholders –faculty education coordinators, other faculty members, pharmacist preceptors and pharmacy students. Data from the survey was analyzed according to question type. Closed-ended questions were analyzed as sums and means; open-ended questions summarized according to theme. Focus groups and interviews were recorded and transcripts were coded and analyzed by the team. **Results:** Participants showed interest in both online learning modules (attractive for the flexibility they offer) and live interactive workshops (valued for the opportunity to interact with colleagues and apply knowledge to cases or scenarios). Education of preceptors regarding expectations and assessment strategies was suggested to address concerns regarding a need for greater standardization of

rotations. Preceptors expressed interest in certificate training in areas of Preceptor Education, Educational Research and Scholarship, and Educational Leadership. They would also like to connect with colleagues virtually about scenarios or challenges and to network with fellow preceptors. **Implications:** Pharmacists are interested in further professional development for their role as a preceptor. Enhancing the foundational components of the current program is essential while determining the feasibility of additional educational offerings that include Certificate Programs, and supports such as a Listserv.

**Developing an Interprofessional Practice Experience by Integrating Pharmacy-Led Learning Experiences Into Physician Assistants Didactic Coursework.** April L. Porter, *University of Missouri-Kansas City*, Paul O. Gubbins, *University of Missouri-Kansas City*. **Objectives:** To lay the foundation for an interprofessional practice advanced pharmacy practice experience (APPE) in a new free clinic for the medically underserved using pharmacy-led practical experiences to reinforce concepts addressed in Advanced Pharmacotherapeutics for Physician Assistant Studies Students (PAS 781). **Method:** Pharmacy students at a new satellite campus have not reached their APPEs. To begin development of an interprofessional practice APPE, PAS 781 students participated in three pharmacy-led practical learning experiences focused on caring for the medically underserved. Learning experiences addressed resources used to care for the medically underserved, pharmacological considerations in such individuals, and the application of pharmacologic principles to the care of this patient population. These experiences were anonymously assessed by all students via 10 specific 5-point Likert scale questions included in the overall course evaluation form. **Results:** All 33 students agreed/strongly agreed the practical experience helped them understand medical, social and economic barriers the medically underserved encounter, and improved their ability to identify the professionals best trained to help overcome these barriers. All students also believed the experience will help them be an effective healthcare team member. The majority of students (n=31 (94%)) agreed/strongly agreed the experience improved their knowledge of community resources for the medically underserved, and their ability to select affordable medicines using cost saving tools (n=30 (91%)). **Implications:** PAS students positively responded to pharmacy-led practical experiences, which suggests pharmacy students, and other health professional learners, can be integrated into this APPE. In the future, interprofessional student teams will be formed to enhance student learning in the clinic.

**Development and Implementation of an Entrustable Professional Activity (EPA) Framework in the Experiential Curriculum.** Diem Thai, *West Coast University*, Reza Taheri, *West Coast University*, Su Y. Lee, *West Coast University*, Amber Verdell, *West Coast University*. **Objectives:** To develop a universal set of EPAs that can be used across core Advanced Pharmacy Practice Experiences (APPEs) and adapt them to Introductory Pharmacy Practice Experiences (IPPEs). **Method:** We developed a list of universal EPAs mapped to the six EPA domains and the Course Learning Outcomes (CLOs) of core APPEs. We then investigated which EPAs could be aligned and adapted to IPPEs based on CLOs. An assessment tool was built to track student's progress towards achieving competency in generalist practitioner abilities longitudinally through the experiential curriculum. **Results:** EPAs specific to the six domains are adaptable across IPPEs and APPEs. Another group of EPAs were formed to assess techniques and abilities unique to rotation type. All EPAs were aligned and adapted to IPPE 1, 2, or 3 to ensure a continuum of opportunity for students to develop competencies. The assessment tool will monitor for growth

in these areas to show student's development from year one to year four. **Implications:** In 2013 the Center for the Advancement of Pharmacy Education articulated general abilities a Doctor of Pharmacy graduate must possess. These have been incorporated into Standards 2016. West Coast University has adopted EPAs and developed a strategy to fully integrate a framework across the experiential curriculum that will ensure a continuum of opportunities for students to develop and achieve competency in abilities expected of graduates.

**Development and Validation of a Pre- Post-Exam With Self-Directed Activities for Primary Care APPEs.** Katelin Lisenby, *Auburn University*, Miranda R. Andrus, *Auburn University*, Kimberly B. Garza, *Auburn University*. **Objectives:** Preceptors for advanced pharmacy practice experiences (APPEs) often assign readings, conduct discussions, and develop assessments to measure learning. However, it is unknown if students can accomplish knowledge retention and application through self-directed activities instead of direct faculty instruction. The objective of this study was to determine the validity of a pre- post-exam to measure learning through self-directed activities. **Method:** This was a retrospective study of 17 students' performance on primary care APPEs with two faculty (n=8, n=9). Each student completed a pre-exam on the first day of rotation; weekly self-directed activities including readings, patient cases, and a journal scan; and a post-exam (identical to the pre-exam) during the last week of rotation. Additional APPE grades (Pharmaceutical Care Ability Profile [PCAP], SOAPs, journal clubs, etc.) were also collected to assess correlation with the exam. Data was analyzed using descriptive statistics, paired-samples t-test, and Pearson's correlation. **Results:** The mean (SD) pre-exam score was 65.8% (11.9) and the mean (SD) post-exam score was 88.5% (8.2). Significant improvement was seen between pre- and post-exam scores (p<.001) with a mean (SD) change of 22.7% (10.9). Pre- and post- exam scores correlated with grades earned on journal club (r=0.609, p=0.016; r=0.546, p=0.035, respectively), final PCAP (r=0.788, p<0.001; r=0.686, p=0.002, respectively), and overall APPE (r=0.813, p<0.001; r=0.720, p=0.001, respectively). **Implications:** Significant improvements in exam scores support self-directed activities as an effective method to improve knowledge retention and application on primary care APPEs. Student performance on the exam correlated with other APPE grades, supporting the validity of our assessments.

**Diversifying Approach to Practice and Care Through International Experiential Education: Implementing and Assessing the Process.** Jennifer Prisco, *MCPHS University-Boston*, Kathleen Head, *MCPHS University-Boston*. **Objectives:** MCPHS University aims to diversify its approach to meeting 2016 ACPE Standards 3 and 4, specifically cultural sensitivity key element 3.5 and self-awareness key element 4.1, through international APPE experiential education initiatives in the Doctor of Pharmacy (PharmD) Program. **Method:** For the PharmD Class of 2016, The Office of Experiential Education, in collaboration with the Center for International Studies, developed four international rotations. Feedback and evaluations were collected, and for the Class of 2017, three more international sites were added. In addition to mandatory 12-question Site/Preceptor Evaluations, participants were required to submit a Student Self-Reflection Rotation Recap following the rotation completion. Qualitative analysis of Reflections and quantitative analysis of Evaluations were reviewed. **Results:** As of January 2017, 32 PharmD students have completed an international rotation as part of this initiative. Site/Preceptor Evaluations: 100% of participants in both graduating classes said YES they would recommend the rotations. The Class of 2016 reported higher abilities to transition from a student to an entry-level practitioner

(mean 3.81) compared to peers (mean 3.73) during international rotations (4-point scale). Reflections: Several students described enhanced professional growth, communication, culture, and opportunity. **Implications:** Data collected show these opportunities contribute to meeting Standards 3 and 4. Demonstrated success is based on student feedback. Other educators could use similar evaluation processes to implement international APPE programs and demonstrate abilities to meet Standards. Furthermore, gathering feedback led to ongoing quality improvement such as advanced implementation support, enhanced preceptor development, and the ability to highlight benefits to future APPE students.

#### **Does Remediation Work? Impact of Student Remediation in an Introductory Skills Series on Community IPPE Performance.**

Rachel A. Allen, *University of Washington*, Kelsey Brantner, *University of Washington*, Laura A. Hart, *University of Washington*, Alex Tu, *University of Washington*, Jennifer L. Bacci, *University of Washington*. **Objectives:** The first year (PY1) skills series at the University of Washington focuses on the provision of patient care in outpatient settings. Students must pass core content areas, or “threads,” to pass each course in the series. The threads are Calculations, Communication, Most Commonly Prescribed Medications (MCP), and Professionalism. Students who do not pass a given thread are required to remediate. The Community Introductory Pharmacy Practice Experience (IPPE) occurs after the first year. The objective of this study was to determine whether remediation in the PY1 skills series affects Community IPPE performance. **Method:** One year of PY1 skills course series and Community IPPE performance and remediation data were included (n=92 students). IPPE performance rankings were dichotomized into meeting or not meeting expectations. Using Fisher’s exact test, students’ IPPE performance was compared between students who did or did not remediate any thread. This process was then replicated for each individual thread. **Results:** Thirty-seven students (40%) remediated one or more threads and 55 students (60%) did not remediate any thread. No difference was found in overall Community IPPE performance between students who did or did not remediate any thread (p=0.361), the Calculations thread (p=0.403), the Communication thread (p=0.555), the MCP thread (p=0.488), or the Professionalism thread (p=1). **Implications:** The results of this analysis indicate that remediating a core area in the PY1 skills series may not affect Community IPPE performance. This finding suggests that remediation may help ensure students have the knowledge base and skills to perform as well as their peers on the Community IPPE.

#### **Effect of Course Structure on the Accuracy of Nonsterile Compounded Preparations.**

Koo Yeon Yoo, *University of North Carolina at Chapel Hill*, Robert P. Shrewsbury, *University of North Carolina at Chapel Hill*. **Objectives:** Nonsterile compounding was originally an intermittent component within the five semester Pharmaceutical Care Laboratory sequence (PCL group). Following curriculum transformation, nonsterile compounding was taught as a 6-week block in the second semester of the PY1 year (6-week group). The study investigated if the transformed course structure negatively influenced students’ ability to accurately compound preparations. **Method:** Accuracy was measured by analyzing the active pharmaceutical ingredient (API) in four preparations compounded by both groups. The API percent of label was compared between the groups (z-test) using a significance level of p<0.05. The preparations represented the broad range of compounding expertise that students were to obtain from the laboratory instruction. **Results:** The accuracy of three preparations was significantly higher in the PCL group than the 6-week group: metronidazole saturated solution (100.86 ± 6.81 versus 102.76 ± 15.83), phenol-menthol troches

(102.25 ± 35.69 versus 133.89 ± 30.98), and hydrocortisone medication sticks (110.40 ± 17.39 versus 60.96 ± 46.5). These preparations were compounded in the first 4 weeks of the 6-week block. The accuracy of enalapril tablet triturates (97.28 ± 50.24 versus 100.0 ± 12.08) was significantly greater in the 6-week group; this was compounded during the sixth week of the 6-week block. **Implications:** By the end of the instructional block, the 6-week group was able to achieve the same level of performance demonstrated by the PCL group. This showed that the new course structure did not limit students in their nonsterile compounding ability.

#### **Effect of Preceptor-Initiated Referral System on APPE Students’ Rotation Progress and Graduation Rate.**

Meghan Bodenbergh, *Butler University*, Julie M. Koehler, *Butler University*. **Objectives:** The objective of this study is to determine whether the referral and monitoring system developed at Butler University College of Pharmacy and Health Sciences (BUCOPHS) for Advanced Pharmacy Practice Experience (APPE) students is successful in improving on-time and overall graduation rates and decreasing rotation failures. **Method:** In May 2014, a formalized process for monitoring and referral of APPE students was established. This allows preceptors to select via the student’s final evaluation form, additional monitoring or referral in the areas of professionalism, time management, drug information, communication, and therapeutic/drug knowledge. The Experiential Education Director meets with referred students and develops a customized longitudinal plan to help each student improve in the identified areas. Data collected for students who were referred included the rotation block, rotation type, preceptor type, and the specific areas recommended for monitoring and referral. In addition, each student’s quarterly progress, specific assessments outlined in each student’s customized longitudinal plan, number of failed rotations, on-time graduation, and overall graduation status was recorded. Butler University’s Institutional Review Board approved the study. **Results:** Between May 2014 and April 2016, a total of 23 students were referred to the Experiential Education Office. Of these, 22/23 (95.7%) graduated on time and 23/23 (100%) ultimately graduated. There were 4 students who failed 1 APPE rotation and no students received more than 1 failure. **Implications:** Development of a monitoring and referral system for preceptors aids in retention of professional pharmacy students and increases on-time and overall graduation rates.

#### **Elevating Evidence-Based Medicine Skills Through an Integrated Sequence of Activities in Advanced Pharmacy Practice Experiences.**

Ann M. Philbrick, *University of Minnesota*, Caitlin Frail, *University of Minnesota*, Jean Y. Moon, *University of Minnesota*, Shannon L. Reidt, *University of Minnesota*. **Objectives:** To be practice-ready, student pharmacists must make clinical decisions with ambiguous and incomplete evidence. The purpose of this study was to determine how a sequence of evidence-based medicine (EBM) activities impacts students’ future approaches to, and confidence in, making decisions when clinical evidence is ambiguous. **Method:** During community pharmacy and ambulatory care Advanced Pharmacy Practice Experiences (APPEs), students completed an integrated EBM sequence of activities centered on an ambiguous clinical issue. First, students were asked a drug information question related to a patient case, and given ten minutes to consult resources before submitting their responses via video recording. Next, they attended a facilitator-led, web-based video journal club based on the same clinical topic. Finally, they submitted a newsletter comparing and contrasting clinical evidence related to the topic. Students were surveyed afterwards to determine how the objectives were met using a Likert-type scale. **Results:** A total of 109 students completed the EBM sequence and 61 (56%) responded to



the survey. Nearly half (49%) reported that the activity only somewhat influenced their approach to solving inconclusive or ambiguous evidence. On the contrary, the majority of students strongly agreed or agreed that the activity 'required skills relevant to my career in pharmacy' (89%) and 'are activities I would expect to do as a pharmacist' (67%). **Implications:** An integrated sequence of EBM activities in APPEs was perceived by students as relevant to their future career; however, the sequence did not have a substantial impact on how students would approach to making clinical decisions based on ambiguous evidence.

**Establishing a Mutually Beneficial Student Medication Reconciliation Service IPPE at a Community Hospital.** Barrett A. Darley, *The University of Georgia*, Linda D. Logan, *The University of Georgia*, Jacqueline McLaughlin, *University of North Carolina at Chapel Hill*, Nicole Pinelli, *University of North Carolina at Chapel Hill*.

**Objectives:** To describe the development and results of a hospital-based medication reconciliation service conducted by third year student pharmacists as a required Introductory Pharmacy Practice Experience (IPPE). **Method:** Medication reconciliation was identified by a partner hospital as a high-value service where University of Georgia (UGA) students could have a beneficial impact. UGA faculty collaborated with University of North Carolina at Chapel Hill (UNC) faculty to adapt a medication reconciliation process used by UNC students at an academic medical center for use at a community hospital by UGA students. Approximately 90 third year students completed this IPPE each semester during Fall 2015, Spring 2016, and Fall 2016. Students were trained by UGA faculty in medication reconciliation and assigned in groups of 7-8 to complete 3-hour sessions at the partner hospital on 3 consecutive days. During these sessions, students conducted medication history interviews with patients, verified medication history with external sources, and worked with preceptors to resolve discrepancies. **Results:** Over 3 semesters, students interviewed 828 patients and documented 2,004 medication related problems. Top discrepancies were related to drug omission (815), dosing (364), inactive medication (306), and frequency (252). There was an average of 2.4 problems per patient. Student evaluations indicated 99.6% agreed or strongly agreed the experience improved their knowledge of inpatient pharmacy services. **Implications:** P3 students contributed to direct patient care activities in the hospital setting as part of a mutually beneficial medication reconciliation IPPE. Processes developed for use at academic medical centers can be successfully adapted for use in community hospitals.

**Evaluation of Student Performance of the Pharmacists' Patient Care Process Using Simulation IPPE.** Julie M. Sease, *Presbyterian College*, Theodora Hampton, *Presbyterian College*, David H. Eagerton, *Presbyterian College*. **Objectives:** To evaluate utility of a week-long simulation introductory pharmacy practice experience (IPPE) for instruction and assessment of students' abilities relative to the Pharmacists' Patient Care Process (PPCP). **Method:** Students from the classes of 2017 and 2018 participated in a week-long simulation IPPE prior to the beginning of third professional year. Students were surveyed pre- and post-course to evaluate their confidence in performing simulated duties of a pharmacist in various settings including ambulatory care, acute care, and community. Students' abilities to perform each component of the PPCP were assessed throughout the week. Overall student satisfaction was evaluated with anonymous survey following the experience. **Results:** 149 students completed the simulation IPPE. Student reported confidence rates increased from 44 (out of 68 possible points) pre-course to 54 (out of 68 possible points) post-course ( $P < 0.05$  per Wilcoxon Signed Rank). Performance on each

aspect of the PPCP was assessed with the following student achievement rates: Collect 87.86%; Assess 82.78%; Plan 74.1%; Implement 79.74%; and Follow-up 68.93%. Students rated their satisfaction at 4.14 out of 5. **Implications:** Student confidence was significantly increased as a result of a week-long simulation IPPE. Each aspect of the PPCP was able to be incorporated into the experience. Cumulative assessment of student progress related to each aspect of the PPCP was able to be generated and shared with students individually allowing for self-assessment and students reported a high degree of satisfaction. As programs investigate ways to incorporate the PPCP, a week-long simulation IPPE may be of value.

**Experiential Factors and Residency Placements: Perceptions of RPDs and Students – Work Experience and Leadership Experience.** Mark L. Yorra, *Northeastern University*, Jennifer Prisco, *MCPHS University–Boston*, Rita Morelli, *MCPHS University–Boston*, Steven J. Crosby, *MCPHS University–Boston*.

**Objectives:** The objective of this study was to compare and contrast the perceptions of residency program directors (RPD's) and students for pharmacy practice residency application considerations. This abstract is examining the opinions related to outside pharmacy work experience and extracurricular activities. **Method:** The New England Regional Departments of Experiential Education (NERDEE) consortium dispersed an anonymous 17 question electronic survey to residency program directors ( $n = 245$ ) and pharmacy students ( $n = 120$ ) from multiple schools in the New England region. The overall survey was designed to evaluate the perceived importance of different factors related to residency candidate placement according to both RPDs and students. **Results:** Overall, RPDs showed a preference for students with pharmacy work experience as compared to non-pharmacy work experience ( $P < 0.001$ ). Within pharmacy work experience, there was a preference of hospital work experience compared to community work experience ( $P < 0.001$ ). Students view the significance of pharmacy work experience similarly to RPDs, ( $P < 0.001$ ), and within pharmacy work experiences, students were similar to RPDs viewing hospital work experience as preferred to community work experience ( $P < 0.001$ ). Overall, RPDs showed a preference for students with leadership roles in pharmacy organizations ( $P < 0.001$ ) and professional organizations (i.e. Student Government Association) ( $P < 0.001$ ). RPDs valued membership in professional organizations more than membership in a non-professional organization ( $P < 0.001$ ). Students rated the importance of leadership in pharmacy organizations and professional organizations lower than the RPDs. **Implications:** Pharmacy faculty can use this information to guide PharmD students pursuing residencies about the importance of pharmacy work experience and leadership experience in pharmacy and professional organizations.

**Experiential Factors and Residency Placements: Perceptions of Residency Program Directors and Students—Letters of Recommendation.** Rita Morelli, *MCPHS University–Boston*, Jennifer Prisco, *MCPHS University–Boston*, Mark L. Yorra, *Northeastern University*, Steven J. Crosby, *MCPHS University–Boston*.

**Objectives:** The objective of this study was to compare and contrast the perceptions of residency pharmacy program directors (RPDs) and students for PGY1 pharmacy practice residency application considerations. This abstract is examining opinions related to letters of recommendations and from which individuals. **Method:** The New England Regional Departments of Experiential Education (NERDEE) consortium dispersed an anonymous 17 question electronic survey to RPDs ( $N = 245$ ) and pharmacy students ( $N = 120$ ) from multiple schools in the New England region. The overall survey was designed to evaluate the perceived importance of different factors related to residency candidate

placement according to both RPDs and students. Questions described in this abstract were rated on a 7-point scale, with 1 = most important and 7 = not at all important. **Results:** No significant differences were found between RPDs and student letter of recommendations importance ( $p > 0.05$ ), except students view a letter from faculty members (mean 1.89) as more important when compared to RPDs (mean 2.72) ( $p < 0.001$ ). Students view a recommendation letter from an APPE Internal Medicine/Inpatient General Medicine (IM) preceptor as the most important individual to write the letter (mean 1.73). RPDs view IM preceptors as most important along with letters from an employer in a pharmacy work setting (both means 2.03). **Implications:** Programs can use this comparison data to educate PharmD students pursuing residencies on what RPDs are concerned with in regards to who should write the letter of recommendation. Experiential programs may consider assigning IM rotations earlier in the APPE year for residency-seeking students

**Experiential Pilot: Interprofessional Mobile Application to Enhance Students' Medication Knowledge and Verbal Communication Skills.**

Patricia L. Darbishire, *Purdue University*, Kiersten Walters, *Purdue University*, Ilya Rybakov, *Purdue University*. **Objectives:** To develop, pilot, assess and describe a new interprofessional game-based phone application intended to help healthcare students learn medication/medical terminology, as well as enhance their ability to communicate this information to a variety of audiences. **Method:** This IRB-approved project called "PharmPhrase" was developed using an application-development software program. The pilot involved multiple groups of competing student teams with each player having a defined role, including "users, responders and scorekeepers." The user explains the randomly generated term to team members based on assumptions of medical literacy within the team. If team members do not understand/identify the term, the user must rephrase in order to "win" the play. Players completed a 5-point Likert scale, retrospective pre- and post-electronic survey on perceptions and feedback on the app to answer the research questions, as well as on student demographics. **Results:** Following 31 students' use of PharmPhrase, 58% claimed familiarity with the medical terms used in the app prior to use ( $M=3.55$ ,  $SD=1.06$ ) and 81% perceiving better understanding of the terms ( $M=4.10$ ,  $SD=0.79$ ,  $p=0.03$ ) after using the app. Likewise, 58% claimed to adapt their communication style to their audience's needs prior to use of the app ( $M=3.52$ ,  $SD=0.626$ ) with 90% noting they are more likely to adapt their communication style to meet the needs of their audience in future healthcare interactions after participating in the game ( $M=4.06$ ,  $SD=0.772$ ,  $p=0.001$ ). **Implications:** This application is an active-learning teaching tool to help move healthcare students' conceptual knowledge to that of understanding and application. The researchers will expand pilots with other healthcare disciplines.

**Impact of Final Year Code Simulations on Resident Perception of ACLS Knowledge and Skill.**

Joe D. Strain, *South Dakota State University*, John A. Kappes, *South Dakota State University*, Brittney A. Meyer, *South Dakota State University*, Teresa M. Seefeldt, *South Dakota State University*, Debra K. Farver, *South Dakota State University*. **Objectives:** To determine the impact of interprofessional advanced cardiovascular life support (ACLS) code simulations completed during pharmacy students' final year on perceptions of knowledge and skills as postgraduate year one (PGY1) residents. **Method:** Final year students electively participated in high-fidelity interprofessional code simulations. Those completing PGY1 residencies were surveyed online approximately 6 months into residency. **Results:** The survey was sent to 68 PGY1 residents over a three-year period with 44 participating

(64.7% response rate). Forty-two respondents (95.5%) participated in a high-fidelity interprofessional code simulation as a student. The majority (79.6%) took the ACLS exam with 72.7% stating the residency program required certification. All residents that took the exam passed on their first attempt. Only 18.2% had a critical care or emergency medicine residency rotation prior to taking the ACLS exam. Approximately half (54.5%) agreed or strongly agreed they are confident in actively participating in an actual code, and 81.8% agreed or strongly agreed they are able to effectively work with interprofessional code teams. Of the respondents who completed ACLS certification, 82.3% agreed or strongly agreed the simulations helped them prepare for certification and of those participating in codes, 78.1% agreed or strongly agreed the simulations helped them prepare for codes encountered during residency. Comments regarding the simulations were favorable. **Implications:** The majority of PGY1 residents perceived interprofessional code simulations, completed during their final student year, helped them prepare for ACLS certification and code situations. Students planning to become ACLS certified should participate in interprofessional code simulations during their final year.

**Impact of IPPE on Student Comfort in Performing APPE Pharmacy Practice Skills.**

Peter M. Brody, *University at Buffalo, The State University of New York*, Jaime L. Maerten-Rivera, *University at Buffalo, The State University of New York*, Fred Doloresco, *University at Buffalo, The State University of New York*. **Objectives:** A survey was administered at the beginning and end of the Advanced Pharmacy Practice Experience (APPE) year to students in cohorts that had participated in Introductory Pharmacy Practice Experience (IPPE) and those who had not. Study objectives were to evaluate the impact of IPPE on student exposure to various practice settings and on student comfort performing pharmacy practice skills. **Method:** A survey was administered to students from 2010 – 2015 both pre and post completion of their APPE year. Students beginning with the 2011 cohort completed IPPE. Outpatient (11 items) and inpatient (10 items) pharmacy practice skills scales were analyzed. Differences between scale scores across cohorts were compared using ANOVA. Effect sizes were also examined. **Results:** Pre-APPE responses indicated that students were exposed to more practice settings after IPPE implementation. In 2010, 85% of the students had experience in a chain community pharmacy but most were lacking experience in all other areas examined. Increases in participation were seen in independent community pharmacy (24-86%), ambulatory care (21-68%), and hospital pharmacy (48-95%, including specialty hospital pharmacy, which increased between 34-85%). The mean scores for the outpatient and inpatient scales did not differ from pre to post in 2010; however, in all other years, the pre mean was lower than the post mean with significant differences noted after 2011 ( $p < 0.001$  to 0.02). **Implications:** IPPE exposes students to varied practice settings and may contribute to student comfort or growth across APPE experiences.

**Impact of Pharmacy Internships on Performance in Pharmacy Practice Experiences.**

Kelsey Brantner, *University of Washington*, Teresa A. O'Sullivan, *University of Washington*, Curtis G. Jefferson, *University of Washington*, Jennifer Danielson, *University of Washington*. **Objectives:** In addition to required Introductory and Advanced Pharmacy Practice Experiences (IPPEs and APPEs), many students acquire pharmacy experience through optional internships (ie, outside employment) during school. Experience gained via internship during school may affect IPPE and APPE performance. This project examines the relationship between internship experience and performance in APPEs and community IPPE. **Method:** Students' self-reported internship experience and preceptor evaluations from community IPPE and

all APPEs completed for the class of 2015 and 2016 were analyzed. For the community IPPE, the number of competencies marked “Exceeds Expectations” versus “Meets Expectations” was compared for students with internships versus those without using a chi-squared test. For APPEs, the average score in ten performance areas (composite score) was used. The average APPE composite scores of non-interns and interns with a year or more of experience were compared using t-tests. **Results:** Analysis included data from 177 students. For the community IPPE, student interns were given “Exceeds Expectations” (7.7 per student) more often than non-interns (7.0 per student;  $p < 0.05$ ). The average composite score on APPEs for non-interns ( $3.38 \pm 0.45$ ) was lower than the average composite score on APPEs for interns with a year or more of internship ( $3.48 \pm 0.38$ ;  $p < 0.05$ ). **Implications:** Findings suggest student with internships perform better on community IPPEs and students with one or more years of internship experience perform better on APPEs. To the extent that external employment does not negatively affect academic performance, schools should encourage students to pursue pharmacy internships.

**Impact of an Interprofessional Education Practice Experience on Medication Histories within a Dental Admissions Clinic.** Melissa E. Rotz, *Temple University*, Rachel von Vital, *Temple University*, Alexander Radovanovich, *Temple University*, Laurie MacPhail, *Temple University Kornberg School of Dentistry*, Chizobam Idahosa, *Temple University Kornberg School of Dentistry*, Jacqueline Theodorou, *Temple University*, Shannon Myers Virture, *Temple University Kornberg School of Dentistry*, Huaqing Zhao, *Temple University School of Medicine*. **Objectives:** Primary: To compare interprofessional (IP) versus standard care on medication history clarifications in dental patients. **Method:** A retrospective chart review was conducted on patients presenting to a dental admissions clinic. Prior to this study, an interprofessional practice experience was designed with pharmacy and dental students to meet accreditation standards for interprofessional education. Patients seeking dental treatment received either standard care from dental students or IP care from pharmacy-dental student teams that collaborated to conduct health and medication histories. Demographic data, medication clarifications (number, type, and drug class), clinical significance of clarifications, and pharmacy interventions to resolve discrepancies were collected and compared between groups. **Results:** 257 charts were included in the analysis, 126 received IP care and 131 received standard care. There were no significant demographic differences between groups. IP care clarified significantly more medication discrepancies compared to standard care (median 9 [IQR 5-14] versus 1 [0-6];  $p < 0.001$ ). Of these clarifications, IP care identified significantly more drug omissions compared to standard care (median 2 [IQR 1-5] versus 0 [0-1];  $p < 0.001$ ). Of the charts with  $> 1$  drug omission clarification (77% IP care, 42% standard care), a majority of these were deemed clinically significant by 2 independent dentists. **Implications:** IP care clarified significantly more medication discrepancies compared to standard care when conducting medication histories in dental patients. A majority of the clarifications for medication omissions were deemed clinically significant with regards to their impact on dental treatment. These results provide evidence that this interprofessional practice experience had a clinically significant impact on patient care.

**Implementation of Interprofessional Education (IPE) Assessment During Advanced and Introductory Pharmacy Practice Experiences.** Rita Morelli, *MCPHS University–Boston*, Catherine Basile, *MCPHS University–Boston*, Andrew Szumita, *MCPHS University–Boston*, Jennifer Prisco, *MCPHS University–Boston*. **Objectives:** Beginning in May 2015, baseline data was collected through an IPE

assessment identifying student encounters with prescribers and health care professionals while on Advanced Pharmacy Practice Experiences (APPEs) and Introductory Pharmacy Practice Experiences (IPPEs) to validate compliance with ACPE Standard 11. **Method:** All students on IPPE and APPE rotations were required to complete an IPE assessment and upload the assessment on the CORE ELMS database. Students were required to document which health care professional(s) they collaborated with, to describe the clinical question that required input from the interprofessional team, to reflect on roles of the team, values, ethics, interprofessional communication, and overall team performance. **Results:** During required APPE rotations a total of 1117 assessments were submitted documenting collaboration with health care professionals with 78% having at least one prescriber encounter. IPE Assessments for APPE were completed consistently across all required rotation types and electives; Internal Medicine (286), Ambulatory Care (258), Institutional Pharmacy (241), Community (215) and Electives (117). During IPPE Institutional there were 172 submissions with 68% of students having an at least one prescriber encounter. During IPPE Community there were 200 submissions with 80% having at least one prescriber encounter. **Implications:** Our results demonstrate that IPE is occurring consistently throughout the APPE and IPPE rotations. In 2016 we improved the collection of the assessment submission method attempting to make the process more user friendly with the goal of increasing IPE assessment submissions. Other educational institutions can use this assessment method to measure experiential continuous compliance with Standard 11.

**Implementation of an Interprofessional Education (IPE) Assessment Tool During Advanced Pharmacy Practice Experiences (APPEs).** Gretchen Jehle, *MCPHS University–Worcester/Manchester*, Kara Bonaceto, *MCPHS University–Worcester/Manchester*, Catherine Basile, *MCPHS University–Boston*, Nicole Carace, *MCPHS University–Worcester/Manchester*. **Objectives:** (1) Identify which healthcare professionals pharmacy students are collaborating with as part of an IPE experience during APPEs. (2) Determine the frequency of APPE student interactions with prescribers (or student prescribers) vs. non-prescribers. (3) Define the rate of occurrence of assessments by APPE rotation type. **Method:** MCPHS University –Worcester/Manchester requires students on APPEs to complete one IPE assessment per core rotation (Ambulatory Care, Community, Institutional, and Internal Medicine). Students document which health care professional(s) they collaborated with and describe the clinical question. They reflect on the team’s roles, values and ethics, interprofessional communication, and the team’s overall performance. **Results:** Students documented IPE assessments during all rotation types describing their interactions with healthcare prescribers and non-prescribers, as well as student prescribers and non-prescribers. Of 1244 completed assessments for 2015-16, 1045 assessments involved interactions with one or more prescriber/student prescriber (84%). IPE assessments were completed on all APPE rotation types (Ambulatory Care (25%), Internal Medicine (23%), Community (22%), Institutional (21%), and Elective (9%)). **Implications:** Development of an IPE assessment tool creates opportunities for students to reflect upon the impact of collaborating with the healthcare team and its influence on patient care. Students are exposed to the learning outcomes described in CAPE subdomain 3.4 (IPE). Self-awareness (CAPE subdomain 4.1) is also demonstrated by allowing student reflection and documentation of their interprofessional experiences. The completed assessments show that each required rotation provides an opportunity for students to interact with the healthcare team. The data may also provide insight to opportunities for further education.

**Implementation of an Interprofessional Education Program Using an Interactive Online Course Format.** Courtney A. Robertson, *The University of Louisiana at Monroe*, Patti Calk, *University of Louisiana at Monroe School of Health Professions*, Sherry Peveto, *University of Louisiana at Monroe Kitty DeGree School of Nursing*, Michael B. Cockerham, *The University of Louisiana at Monroe*. **Objectives:** To describe the pilot phase of an online Interprofessional Education (IPE) course initiative within a university without a medical school or affiliated academic medical center and assess professional students' perceptions and attitudes regarding IPE and our current program. **Method:** One hundred ninety-nine pharmacy, nursing, and master of occupational therapy students were enrolled in an 8-week entry-level IPE course and interacted online through a series of assignments aligned with Domains 1 and 2 of the IPEC Core Competencies. The course included IPE information, weekly discussion forums surrounding competencies, and a patient case. Students completed IRB approved pre-, post-, and retrospective pre-post surveys regarding their attitudes toward interprofessional teams and team approach to care. Statistics were calculated for all items and compared using paired t tests with  $\alpha = 0.05$ . **Results:** All responses indicated statistically significant increases in knowledge of IPEC competencies. Comparing retrospective to post-survey responses, there was improvement in students' perceptions of self-efficacy (12.02%), attitudes toward IPE (13.31%), and perceptions of own profession in relation to others (5.58%) with mean scale changes  $p < 0.0001$ . These changes indicate students' increased understanding of other professions with more accurate reflection of their previous knowledge in IPEC competency areas. **Implications:** Students interacted as interprofessional team members to discuss enhancement of patient care, but indicated the absence of medical students was a limitation to provision of care. To address ACPE's 2016 IPE requirements, hopes for further IPE implementation include collaboration with providers and continued use of an online approach with virtual face-to-face interactions.

**Incorporation of Interprofessional Education Within Introductory Pharmacy Practice Experiences (IPPEs).** Maryann Z. Skrabal, *Creighton University*, Rhonda M. Jones, *Creighton University*, Kelli L. Coover, *Creighton University*, Kelly J. Anderson, *Creighton University*, Ann M. Ryan Haddad, *Creighton University*. **Objectives:** The Accreditation Council for Pharmacy Education (ACPE) requires that pharmacy schools incorporate interprofessional education (IPE) activities within both didactic and experiential portions of the curriculum. Creighton's School of Pharmacy and Health Professions requires all health science students to complete IPE 400 Introduction to Collaborative Care, which is a 0.5 credit online course that must be completed during their 1st semester. IPE 400 introduces interprofessional collaborative practice knowledge and concepts. This project will describe the IPE 400 course components, IPE components within IPPEs, and the impact of IPPE revisions on student reflections. **Method:** IPPE learning objectives were revised to include IPE outcomes. Mandatory reflection questions at the end of the IPPE were revised to include IPE-related questions and discussed in group reflection sessions. Student reflections were reviewed by the IPPE faculty instructors to identify themes. **Results:** P1 students complete four 4-hour shadow visits, P2's complete a 120-hour community IPPE, and P3's complete an 80-hour hospital IPPE. 451 students completed IPPE reflections during the fall 2016 semester. IPE themes identified included the importance of: the pharmacist on the healthcare team; the pharmacist's ability to multi-task and communicate; and patient-centered care. Descriptive data regarding opportunities and challenges of incorporating IPE activities within IPPEs will also be presented. **Implications:** IPE reflection

themes will assist our experiential office in 1) identifying current IPE activities within the community and hospital practice environments, and 2) further evaluating and revising our IPPE requirements regarding IPE knowledge and experiential activities. Data presented may also assist other schools in developing IPE introductory experiential activities.

**Individual Development Plan: A Tool to Address the Accreditation Standard for Personal and Professional Development.** Deanna Gee, *Touro University California*, Rae R. Matsumoto, *Touro University California*, Margaret Schulte, *Touro University California*, Mohamed Jalloh, *Touro University California*. **Objectives:** To create and implement a planning tool to assist pharmacy students in career planning and address ACPE 2016 Standard 4 Personal and Professional Development. **Method:** An Individual Development Plan (IDP) template for pharmacy was developed and implemented in a Doctor of Pharmacy program to guide students in defining career goals, self-evaluate skills, and develop individualized action plans. First-professional-year students from a private pharmacy school (N=104) completed the IDP which were evaluated for addressing the ACPE accreditation standard for Personal and Professional Development. Study investigators rated whether students addressed each of the four key elements identified in the standard (Self-Awareness, Leadership, Innovation and Entrepreneurship, and Professionalism) as attained or needing development, with the data summarized using descriptive statistics. **Results:** Self-Awareness (100%) and Professionalism (100%) were the most commonly documented Standard 4 key elements, followed by Leadership (50.96%), and Innovation and Entrepreneurship (22.12%). Although certain key elements were reported more frequently than others, all four key elements were capable of being addressed through the IDP. **Implications:** The IDP can be implemented into pharmacy education as a cornerstone of the personal and professional development plan for students to address ACPE 2016 Standard 4. Students enter pharmacy school understanding the importance of possessing and developing self-awareness and professionalism skills, with less recognition of the importance of leadership and innovation/entrepreneurship. Programmatic development and awareness of these latter skills will need to be instilled in all students during the program to fully fulfill the goals of ACPE Standard 4.

**Instilling Continuing Professional Development Principles Through Development of an Advanced Pharmacy Practice Experience Preparatory Course.** Cheryl L. Clarke, *Drake University*, Kathryn A. Schott, *Drake University*. **Objectives:** To describe development of a two-semester advanced pharmacy practice experience (APPE) preparatory course series designed to 1) instill continuing professional development (CPD) principles into APPE preparation and selection processes; and 2) develop student skills, attitudes and abilities to demonstrate attainment of Standards 2016 Domain 4 Personal and Professional Development. **Method:** The required 0.5 credit hour courses were designed for P3 students, focused on introducing and applying the principles of CPD into APPE and career planning processes. Primary format was lecture, discussion, group activities, and reflection. Students focused on strengthening self-awareness by completing self-assessments exploring their leadership strengths (StandOut), preferred learning styles (HPILS), and personal brand development. Short, intermediate, and long-term career SMART goals were developed along with plans to achieve those goals. Students conducted an inventory of "tools" to reach those goals through Curriculum Vitae creation. Students applied CPD principles to best match APPE selections with stated goals. Second semester activities included giving and receiving feedback, conflict management, and continued

goal refinement based on APPE placements. Data were collected through course evaluations. **Results:** Anonymous IDEA course evaluations were positive (Excellent Course 4.2 and 4.0 of 5 across each semester respectively). Progress for the learning objective “developing specific skills, competencies, and points of view needed by professionals in the field” was rated as “substantial” or “exceptional” by 65 and 75% of students in respective semesters. **Implications:** This course series provided opportunity for application of CPD principles in preparation for APPEs. Further evaluation will determine if APPE matches were improved.

**Integrating IPE in Institutional IPPE: Structured Interprofessional Active Observation.** Veronica S. Young, *The University of Texas at Austin*, Donna M. Burkett, *The University of Texas at Austin*, Lillian Tran, *The University of Texas at Austin*, William J. McIntyre, *The University of Texas at Austin*. **Objectives:** Shadowing is a well-established form of experiential learning with applicability to interprofessional education (IPE). Previous reports described success utilizing shadowing as a means for learners to explore other professions’ roles. The objective of this program, piloted in second year pharmacy students during their Institutional Introductory Pharmacy Practice Experience (IPPE), aims to develop a framework for structured and active observation of health and social care professionals intentionally designed to assess interprofessional competencies. **Method:** A guidance document and tools to engage students and shadowed practitioners in a structured, interactive experience were developed in collaboration with a Canadian university. Learning outcomes were assessed quantitatively and qualitatively based on student reports and responses to student and preceptor surveys. **Results:** Survey responses showed high acceptance from students and preceptors. The guidance document and tools provided a framework for the experience. All preceptors strongly agreed it helped students gain a better understanding of the roles and responsibilities of other professions. A majority of students reported the experience met IPE outcomes well/very well. Assessment of student reports identified themes corresponding to the interprofessional competencies: increased mutual respect of other professions, increased appreciation of the unique and overlapping responsibilities of pharmacists with other professions, and recognizing the importance of interprofessional communication and teamwork. Implementation did not appear to increase preceptor burden. **Implications:** Building a framework for shadowing that emphasizes structure, active engagement and outcomes assessment has value in addressing interprofessional competencies for beginning and advanced learners. Sustainability must address student perceived value and burden to preceptors and shadowed practitioners.

**Interprofessional Education: Chaplain Shadowing Experience during Clinical Experiences.** Maryann Z. Skrabal, *Creighton University*, Diane Jorgensen, *Creighton University*, Gladyce Janky, *Creighton University*, Rhonda M. Jones, *Creighton University*, Ann M. Ryan Haddad, *Creighton University*. **Objectives:** Health Professions’ students need to understand the roles and responsibilities of other members of the healthcare team. The Interprofessional Education (IPE) Chaplain Shadowing Experience was designed to provide a unique opportunity for health science students (Pharmacy /OT) to learn about the importance of spirituality in health and healing, and the chaplain’s role within the health care team by shadowing a hospital chaplain during their clinical experiences. **Method:** As part of a pilot project, students spent 4 hours shadowing a hospital chaplain during a clinical rotation at one of Creighton’s primary teaching hospitals. The students completed pre-readings about the chaplain’s role on the team prior to the experience, as well as a pre/post-survey and

a one-page reflection paper. **Results:** Data from the first 24 students has been reported. There was significant improvement in their knowledge and expectations for values/ethics, roles/responsibilities, IPE communication, and team/teamwork in the clinical setting. ( $p < 0.05$ ) Students described ‘being exposed to the spiritual side of care’ and ‘the impact on the patient’s overall health’ as eye-opening. Complete qualitative and quantitative data will be published on the poster. **Implications:** The success of this pilot project has led to the expansion of chaplain shadowing experiences to additional hospital sites and clinical experiences. This unique experience learning about the chaplain’s role within the healthcare team may help students learn the importance of spirituality in health and healing, as well as offer an example of a unique IPE experience for other pharmacy schools/colleges.

**Longitudinal Assessment of the Readiness for Interprofessional Learning Among Student Pharmacists.** Hillary A. McNamee, *Purdue University*, Allison M. Hester, *Purdue University*, Kimberly S. Plake, *Purdue University*, Karen S. Yehle, *Purdue University School of Nursing*. **Objectives:** The objective of this project was to evaluate the retention of student pharmacists’ readiness for interprofessional learning after completing interprofessional education (IPE) activities in the curriculum. **Method:** Student pharmacists ( $N=300$ ) participated in an IPE experience in the first and third professional years of the program. Students completed pre and post-assessments for each activity. The Readiness for Interprofessional Learning Scale, a 19 item instrument, was utilized to assess four areas: shared learning, teamwork and collaboration, roles and responsibilities, and professional identity. Students responded to each item using a Likert scale with 1=strongly disagree and 7=strongly agree. A student-created identifier linked individual student assessments over the four time points. Descriptive statistics were performed for all items and subscales. Repeated measures ANOVA was conducted for each subscale over time. **Results:** Two hundred three students (67.7%) with complete identifiers on all assessments were included in the analysis. In order to assess retention of student attitudes toward IPE, the primary time points of interest for this report were student scores upon completion of the activity in the first professional year and before beginning the activity in the third professional year. There was a statistically significant decrease in the shared learning subscale [P1: 41.83 (8.39) vs. P3: 39.46 (4.71),  $p < 0.005$ ]. There were no statistically significant differences for the remaining subscales. **Implications:** IPE experiences can assist students in developing positive attitudes towards working in a collaborative environment. Results suggest it may be necessary to incorporate regular IPE activities in the curriculum.

**Longitudinal Interprofessional Education (IPE) Activities at an Academic Health Sciences Center.** Gina M. Baugh, *West Virginia University*, Mary K. Stamatakis, *West Virginia University*. **Objectives:** (1) Develop a longitudinal experience that focuses on the Core Competencies of the Interprofessional Education Collaborative (IPEC). (2) Determine the impact of these experiences on a student’s perception of IPE and teamwork. **Method:** Students from pharmacy, medicine, nursing, dentistry, dental hygiene, physical therapy, laboratory sciences, and occupational therapy participated. Four annual sessions focused on: professional roles/responsibilities, interprofessional communication, teams and teamwork, and quality/safety. Working as an IP team, students learned the role of each health care provider and began to build relationships with students from other disciplines through problem-solving, team-based activities. Groups utilized the TeamSTEPS® framework for applicable sessions. All students completed survey questions to assess their perceived impact of each session and pharmacy students also self-assessed their mastery of

teamwork. **Results:** Quantitative and qualitative survey results reveal that students from all disciplines agreed that the sessions were valuable and useful for future classes, and this has been improving each year as sessions are updated based on student feedback. Pharmacy students self-assessed their mastery of teamwork/IP communications at year end by ranking their perceived proficiencies on a 4-point Likert scale (1 = beginner/novice; 2 = competent; 3 = proficient; 4 = master/expect). Scores ranged from beginner to competent. Mean score for “contributes during team discussions” was 2.5, “fosters constructive team climate was 2.6,” and “engages the work of team members” was 2.3. **Implications:** Exposure of students to participatory IPE programming, particularly early in their studies, led to a better understanding of their role as part of the healthcare team.

**Multiple Potency Determination as an Additional Assessment Tool of Aseptic Compounding Technique.** Rebecca K. Lee, *University of North Carolina at Chapel Hill*, Robert P. Shrewsbury, *University of North Carolina at Chapel Hill*. **Objectives:** Direct observation of students’ aseptic technique is a common evaluation method. Our study investigated an additional assessment criteria - potency testing of compounded preparations - to determine what further insights can be gained into students’ aseptic technique. **Method:** PY1 students performed three aseptic technique skill based encounters, each separated by two weeks, and were evaluated using a rubric. Students also determined their preparations’ potency; acceptable preparations were  $\pm 10\%$  of label. The encounters were transferring drug from a vial to an IV bag, transferring drug from an ampule to an IV bag, and reconstituting a powdered drug in a vial and transferring to an IV bag. **Results:** The observational scores were significantly different between the vial and other two encounters (z-test,  $p < 0.05$ ). The percent of students having acceptable potency was 67.3% (vial), 66.7% (ampule), and 68.3% (reconstitution). Average potency among all preparations was  $99.0 \pm 22.6\%$  (vial),  $97.1 \pm 9.1\%$  (ampule), and  $91.7 \pm 13.2\%$  (reconstitution). Histograms showed improved potency (decreased range and skewness, increased kurtosis) with the ampule compared to the other preparations. **Implications:** Although observational scores were acceptable, up to 30% of students did not meet potency criteria. The vial and reconstitution encounters required students to correctly pressurize vials, while the ampule encounter did not, which may explain the histogram observations. Observational scores were not able to highlight the more subtle requirements of good aseptic technique; therefore, we recommend potency analysis of all student aseptic compounded preparations.

**Optimizing the APPE Scheduling Process Using PharmAcademic.** Denise M. Klinker, *University of Florida*, Karen Whalen, *University of Florida*, Melissa Willingham, *University of Florida*, Alan Auyeung, *University of Florida*. **Objectives:** To describe the optimization of advanced pharmacy practice experience (APPE) scheduling using the match engine in PharmAcademic. **Method:** Starting in 2014 the University of Florida implemented a series of progressive changes to PharmAcademic programming and the scheduling process based on feedback from experiential faculty, students, and data from prior years. Each year the percentage of APPEs scheduled via manual and automated processes was calculated, and PharmAcademic metrics were used to determine the percentage of students placed in quality APPEs. Student satisfaction and perception of fairness with the scheduling process were assessed using a post-scheduling Qualtrics survey, and graduating student survey data. Chi-squared was used to compare categorical variables and descriptive statistics were used to characterize the trends in each data set. **Results:** The percentage of manually scheduled rotations decreased from 97.3% in 2015-2016 to 13.0% in

2017-2018 ( $p < 0.01$ ). The percentage of quality rotations scheduled increased from 79.1% in 2015-2016 to 99.8% in 2017-2018 ( $p < 0.01$ ). The percentage of students who were satisfied or very satisfied with their schedule increased from 50.8% in 2016-2017 ( $n = 61$ ) to 81.6% in 2017-2018 ( $n = 114$ ). **Implications:** Optimization of the PharmAcademic match engine greatly decreased the number of manually scheduled APPEs which has the potential to reduce faculty and/or staff time allocated to the scheduling process. Sharing lessons learned from the scheduling optimization process may be beneficial to other institutions in establishing best practices.

**Pharmacy Student Factors and Residency Placements: Perceptions of Program Directors and Students – Overall Important Considerations.** Jennifer Prisco, *MCPHS University–Boston*, Mark L. Yorra, *Northeastern University*, Rita Morelli, *MCPHS University–Boston*, Steven J. Crosby, *MCPHS University–Boston*. **Objectives:** To compare and contrast perceptions of residency pharmacy program directors (RPDs) and students for PGY1 pharmacy practice residency application considerations. This abstract compares opinions related to the importance of 26 applicant factors ranging from in-person interviews, ASHP Midyear attendance, communication skills, and various experiences. **Method:** The New England Regional Departments of Experiential Education (NERDEE) consortium dispersed an anonymous 17 question electronic survey to RPDs ( $N = 245$ ) and students ( $N = 120$ ) from multiple colleges. The survey was designed to evaluate the perceived importance of factors related to residency candidate placement according to both RPDs and students. **Results:** Highlights: In-person interviews rather than phone/ videoconference interviews are significantly more important to RPDs than students ( $P < 0.05$ ). 40% of RPDs picked in-person interviews as a Top 5 important deciding factor, and 27% of student ranked this as a Top 5 factor. ASHP Midyear attendance is significantly more important to students ( $P < 0.05$ ). Additionally, 46% of RPDs selected student work experience as a Top 5 deciding factor for residency selection as compared to 29% of students viewing this as a Top 5 factor. Both students and RPDs selected Program Fit as the most important deciding factor for residency selection. Strong letters of recommendation, verbal communication skills, and a well-written letter of intent/interest were also in the Top 5 factors for both groups. **Implications:** Based on results, this could influence the way colleges emphasize curricular and extra-curricular qualities deemed important for residency-seeking students. Possible pedagogical changes to current practice for co-curricular activities could be considered as well.

**Pharmacy Student Intervention Documentation During Second-Year Clinical Early Immersion Experiential Rotations.** Peter Koval, *University of North Carolina at Chapel Hill*, Jennifer J. Kim, *University of North Carolina at Chapel Hill*, Stacey Karl, *Cone Health*. **Objectives:** To evaluate pharmacy student intervention documentation during second-year clinical early immersion experiential rotations. **Method:** In Fall 2015, the University of North Carolina Eshelman School of Pharmacy enrolled students into a new curriculum with three 8-week early immersion experiences during the second year, 1 of 3 including either ambulatory care or inpatient clinical, to replace introductory pharmacy practice experiences. Before their first clinical early immersion experiences, Greensboro Area Health Education Center (GAHEC) students were oriented to electronic intervention documentation and given a training handout with periodic reminders encouraging documentation. Electronic reports were generated to evaluate interventions using descriptive statistics. **Results:** A total of 58 interventions were documented during the first clinical immersion experiences; all but 1 were accepted. An average of

28 minutes was spent on each intervention (range 5-60). The most common intervention types were pharmacy monitoring (34%), other (28%), and needs additional drug therapy (19%). The interventions resulted in optimized therapy (38%), avoided adverse drug events (25%), and cost savings (21%). **Implications:** There is currently a lack of published research regarding student clinical intervention documentation, and more research will help to further our understanding. This study provides insight particular to second-year pharmacy students. Clinical intervention documentation can introduce students to the dynamics of pharmacist roles requiring activity tracking to sustain or expand positions. Documenting interventions can also help with knowledge application and self-reflection. Student clinical activities can also be tracked and extrapolated to justify or expand services. Overall, student intervention documentation can illustrate the value pharmacy students bring to each organization.

**Preceptor Self-Assessment of Preparedness and Continual Development Needs.** Julie A. Testman, *University of Charleston*, Latasha Marshall, *University of Charleston*. **Objectives:** To evaluate preceptors' perceived level of preparation and extent of continual development needed to incorporate selected activities within their rotation experiences. **Method:** A self-assessment instrument was developed and emailed to all program affiliated introductory and advanced pharmacy practice experience (IPPE and APPE) preceptors. The 34-item assessment was divided into three sections: demographic information (10), understanding of areas necessary for preceptor preparation (9), and extent of continual development needed to incorporate selected activities (15). Results were analyzed using Qualtrics software and Microsoft Excel. The University's Institutional Review Board approved the study following exempt review. **Results:** Sixty-nine of 375 preceptor recipients (18.4%) completed the assessment. Seventy-five percent of respondents indicated serving as program preceptors for less than 5 years. In regard to preparation, the top three areas for which preceptors perceived limited to no understanding included the Joint Commission of Pharmacy Practitioners Pharmacists' Patient Care Process (42.03%), the program's IPPE learning objectives (30.43%), and Accreditation Council for Pharmacy Education Standards 2016 (24.64%). For extent of continual development to incorporate selected activities, the highest proportion of preceptors responded that extensive or significant assistance was needed in utilizing the layered-learning model (42.02%), addressing cultural competency and health literacy issues (26.09%), and integrating team-based learning (24.63%). **Implications:** Based on the assessment results, a comprehensive preceptor development program was implemented using various delivery mechanisms (e.g., live, web-based, print, one-on-one discussions) to ensure new preceptors are appropriately oriented and prepared to accept students and existing preceptors receive continual development in key areas of need.

**Preceptor Self-Assessment: Jump Starting Continuous Professional Development (CPD).** Jennifer Chang, *University of Washington*, Teresa A. O'Sullivan, *University of Washington*, Eric Kha, *University of Washington*. **Objectives:** Evaluate the impact of preceptor self-assessment tool in engaging preceptors in CPD **Method:** A new preceptor self-assessment tool was designed and implemented to guide preceptors through the initial (Reflect and Plan) steps of CPD Cycle. The self assessment tool included the following: o Opportunity for preceptors to review and evaluate their Site and Preceptor Report Cards\* \*Preceptor Report cards included student comments and evaluation of preceptor behaviors across the 3 areas: 1. Role-Modeling 2. Teaching/Coaching 3. Facilitating o Preceptor self rating of how consistently they demonstrated the the same preceptor behaviors to their

students o Preceptor self reflection on: 1. Strengths as preceptor 2. Areas of improvement 3. One example of something preceptor plans to do/implement The preceptor self assessment tool was administered as part of the annual preceptor profile update for Clinical and Affiliate Faculty appointment review. **Results:** Total of 375 preceptors updated their Preceptor Profile: ● # of preceptors that reviewed their report cards: 243 ● # of preceptors who were please with their student evaluations this year: 216 ● # of preceptors that listed their strengths as a preceptor: 283 ● # of preceptors who provided reflections regarding improving as a preceptor: 263 ● # preceptors who provided one example of something they plan to do: 232 Qualitative analysis of the preceptor self assessment data was also conducted. **Implications:** Quantitative and qualitative analysis of the preceptor assessment tool data showed that the tool was effective in engaging the preceptors in CPD and helped identify opportunities for preceptor development programs and tools.

**Preceptor's Grading Scale Preference for Pharmacy Practice Experiences and Assessment of the Common Grading Scale.** LeAnne Honeycutt Varner, *Philadelphia College of Osteopathic Medicine*, Brent Rollins, *Philadelphia College of Osteopathic Medicine*, Julie Wickman, *Philadelphia College of Osteopathic Medicine*, Remya Radhakrishnan, *Philadelphia College of Osteopathic Medicine*, Christina Hunley, *Philadelphia College of Osteopathic Medicine*, Cierra Goodwin, *Philadelphia College of Osteopathic Medicine*, Navpreet Singh, *Philadelphia College of Osteopathic Medicine*, Tolu Oyemakinwa, *Philadelphia College of Osteopathic Medicine*, Evan Prescott, *Philadelphia College of Osteopathic Medicine*. **Objectives:** To gain an understanding of preceptors' grading scale preferences for introductory and advanced pharmacy practice experiences (IPPE/APPE). Secondarily, assess if there is a common grading scale for IPPE/APPE rotations among U.S. Schools of Pharmacy. **Method:** An online, 22-item online survey questionnaire was sent to Philadelphia College of Osteopathic Medicine-Georgia Campus, School of Pharmacy (PCOM-GA SOP) preceptors to gauge an understanding of their grading scale preference. A phone survey was also conducted to 136 Schools of Pharmacy in the United States to assess whether there is a common grading scale for the introductory and advanced pharmacy practice experiences. **Results:** Of the 655 preceptors PCOM SOP contacted, 373 responded to the questionnaire. Most (42%) of the preceptors who responded were from retail/community setting, followed by hospital pharmacists (26%). When comparing the community and noncommunity setting, on average the community preceptors preferred the pass/no pass grading scale, whereas the noncommunity hospitals preferred letter grades, but results were statistically insignificant (adjusted alpha=0.006, p=0.013). Most preceptors who had a pass/no pass grading system as a student preferred the same grading system for their students. Preceptors who had a letter grading system also preferred the same grading system for their students. **Implications:** The majority of preceptors preferred the letter grading scale over the Pass/No Pass grading system. A significant number of preceptors preferred the grading scale they had as a pharmacy student. The results from this study can be used for established and future schools and colleges of pharmacy when considering experiential or curriculum grading changes.

**Quality Assurance and Improvement Practices of Experiential Education Programs Within US Schools of Pharmacy.** Mitra Assemi, *University of California, San Francisco*, Margarita V. DiVall, *Northeastern University*, Kelly C. Lee, *University of California, San Diego*, Erin Sy, *University of Washington*, Teresa A. O'Sullivan, *University of Washington*. **Objectives:** To identify common practices for

measuring quality of preceptor performance, experiential sites, experiential coursework, student performance and achievement of student learning outcomes at the US schools/colleges of pharmacy. **Method:** In-depth semi-structured phone interviews were conducted with directors of experiential education, or their equivalent, to identify elements of experiential education quality assurance processes (EEQAPs). To ensure a representative sample from all fully accredited programs, purposive sampling was used for participant solicitation and enrollment until both code and meaning saturation were reached. Participants were asked questions in six domain areas (preceptor and student performance, site quality, role of site visits, coursework and achievement of learning outcomes). An iterative data coding and analysis process identified themes and notable practices within each domain area. **Results:** Interviews were conducted with a nationally representative sample of 29 programs. All participants reported evaluating preceptor performance. Fewer participants identified a deliberate site assessment process, with most equating preceptor and site evaluation. Participants conducted site visits primarily to assess site quality and maintain relationships with preceptors. Few participants were able to provide details of a process used for evaluating experiential education coursework and student outcomes. All participants used student performance assessments to measure the quality of student performance. Overall, participants nearly universally reported collecting data, less frequently described processes for data evaluation, and rarely shared outcomes related to data collection and analyses. **Implications:** Themes and notable practices identified in this study provide initial benchmarks for EEQAPs and will inform content and metrics of subsequent follow-up studies.

**Quantifying Community Based IPPEs - A Two-Year Analysis and Estimated Cost Savings.** Catherine Oswald, *Roseman University of Health Sciences*, Phillip Lawrence, *Roseman University of Health Sciences*, Erin L. Johanson, *Roseman University of Health Sciences*, Danielle Smith, *Roseman University of Health Sciences*, Darla Zarley, *Roseman University of Health Sciences*. **Objectives:** The purpose of this study is to determine what activities IPPE students completed during their community-based IPPE rotations, and to estimate the associated cost savings. **Method:** Data submitted by first and second year community IPPE pharmacy students, via a 20-question electronic form, at the end of each IPPE day, during the 2014 – 2016 academic years were retrospectively analyzed. Activities were categorized as either pharmacist or technician duties and the requisite time for each task was estimated. A cost savings impact was calculated by multiplying the time for each task by the Bureau of Labor Statistics 2016 average hourly wages for the corresponding personnel. **Results:** Data were collected for 998 students (503 P1's for 17 visits; 505 P2's for 18 visits), located on 2 campuses, comprising a total of 17,659 eight-hour IPPE community site visits (141,272 hours total). Average cost savings per student, per rotation was \$1,535 (\$1,196 for P1 students and \$1,877 for P2 students). The largest contributors to cost savings were transferring prescriptions into the pharmacy, physically filling medications, and counseling patients on prescriptions, with cost savings of \$270, \$228, and \$226 per student per rotation, respectively. **Implications:** By quantifying the potential cost savings provided by IPPE students, the financial value of precepting and advocating for additional preceptors and preceptor development can be articulated in a meaningful way. Furthermore, by conducting this foundational research, colleges of pharmacy can begin to develop more complex cost-effectiveness models for pharmacy experiential education benefiting patients, preceptors, sites and students.

**Quantity and Type of Patient Encounters During Required Advanced Pharmacy Practice Experiences.** Bethany Anne Von Hoff,

*University of Minnesota*, Caitlin Frail, *University of Minnesota*, Scott Chapman, *University of Minnesota*, Jody L. Lounsbury, *University of Minnesota*, Jean Y. Moon, *University of Minnesota*, Chrystian R. Pereira, *University of Minnesota*. **Objectives:** To quantify and describe patient encounters experienced during required Advanced Pharmacy Practice Experiences (APPEs). **Method:** During 12-week acute care/institutional (AC/INST) APPEs and 15-week combined community pharmacy and ambulatory care (CPAC) APPEs, fourth-year students completed estimated weekly (AC/INST) or daily, per encounter (CPAC) patient tracking surveys. Students documented the number of patient encounters, type of care provided, primary and secondary diagnoses, and special dosing considerations (e.g. kidney dysfunction, pregnancy). The data are compiled into individual reports provided to students and overall tracking reports each semester. **Results:** During AC/INST APPEs, 98 students self-reported 28,883 patient encounters (mean 24 encounters/student/week) and 27.8% of patients (mean 6.8 encounters/student/week) received care in an intensive care unit setting. The primary type of care provided was transitions of care (31%). Most common primary diagnoses reported during AC/INST APPEs were infectious diseases, diabetes, and atrial fibrillation. During CPAC APPEs, 117 students documented 6,955 encounters (mean 4 encounters/student/week), with 76.8% as new/initial encounters (mean 3 encounters/student/week). The primary type of care provided was patient education/counseling (41.9%). Most common primary diagnoses reported during CPAC were diabetes, infectious diseases, and hypertension. **Implications:** Tracking patient encounters can be used institutionally to ensure consistency and quality of students' experiences, identify opportunities for site and preceptor development, and provide insight to didactic instructors regarding experiences downstream in the curriculum. Students may use the individual reports to track personal learning and progress, as one measure of readiness for patient care.

**Self-Perceived Knowledge and Confidence Regarding Infectious Diseases of Advanced Pharmacy Practice Experience (APPE) Students.** Christopher Bland, *The University of Georgia*, Brent Sasaki, *The University of Georgia*, Bruce M. Jones, *St. Joseph's/Candler*, Emily Heil, *University of Maryland*, Sarah Hinton, *South University*, Christina Maguire, *The University of Georgia*, Michael J. Fulford, *The University of Georgia*, Kayla R. Stover, *The University of Mississippi*. **Objectives:** Infectious diseases (ID) pharmacotherapy knowledge and confidence are becoming increasingly important as new antimicrobial stewardship programs (ASP) are initiated. The objective of this study is to survey pharmacy students currently on APPEs to determine their self-perceived ID knowledge and confidence. **Method:** An internet-based survey was sent to current APPE students at four U.S. pharmacy schools from 2015-2016. The survey asked subjects to gauge the level of knowledge and confidence regarding various ID pharmacotherapy variables through Likert scales. The primary study outcome is a comparison of self-perceived knowledge and confidence levels before and during APPEs assessed using paired sample t-tests. The secondary outcome was a comparison of self-perceived knowledge and confidence in students with or without an ID rotation assessed using independent t-tests. **Results:** For every variable, students surveyed reported greater ID knowledge (n=123) and self-confidence (n=105) while on APPE rotations compared to before rotations (p<0.001). Students with ID-specific rotations had higher self-perceived knowledge in several areas including basic microbiology (p=0.019), principles of antimicrobial stewardship (p=0.10), and overall ID-knowledge (p=0.017). Students with ID-specific rotations also had higher self-perceived confidence in selecting antimicrobial



dose/frequency ( $p=0.034$ ), using an antibiogram ( $p=0.047$ ), de-escalating therapy upon culture results ( $p=0.002$ ), and principles of antimicrobial stewardship ( $p=0.022$ ). They also were more confident in discussing medication issues with other healthcare providers ( $p=0.004$ ). **Implications:** The Centers for Medicare/Medicaid services and Joint Commission have helped make ASPs required in all hospitals to improve ID outcomes. Strong consideration should be given for maximizing ID APPE experiences to best equip graduates for these expanding positions.

**Student Self-Efficacy in the Community Pharmacy Introductory Pharmacy Practice Experience.** Fraidy N. Maltz, *Long Island University*, Anna Nogid, *Long Island University*, Bupendra Shah, *Long Island University*. **Objectives:** LIU Pharmacy underwent major curricular revision in 2013. Students now complete an introductory laboratory course aimed to prepare them for the community pharmacy IPPE (CP-IPPE) one year earlier in the curriculum. The purpose of this study was to determine if these curricular changes affected students' self-efficacy by comparing self-efficacy scores in both curricula. **Method:** During the last week of the CP-IPPE, students from both curricula completed an online survey to rate their self-efficacy in 15 ability areas before and after the IPPE using a 5-point Likert scale (1=not at all confident to 5=extremely confident). **Results:** A total of 112 (63%) students in the new curriculum (NC) and 122 (63%) students in the old curriculum (OC) completed the survey. Students reported having similar pharmacy work experience. Before CP-IPPE self-efficacy mean scores were comparable in 10/15 ability areas. OC students' before CP-IPPE self-efficacy mean scores were significantly greater in four ability areas: identifying and resolving DUR computer software alerts (OC 3.14 vs. NC 2.62;  $P=0.003$ ), patient counseling (OC 3.38 vs. NC 2.81;  $P=0.001$ ), prescription interventions (OC 3.26 vs. NC 2.76;  $P=0.001$ ), and OTC product selection and counseling (OC 3.35 vs. NC 2.89;  $P=0.005$ ). NC students had higher before CP-IPPE self-efficacy mean scores in helping patients select a Medicare Part D plan (NC 3.23 vs. OC 2.77;  $P=0.008$ ). **Implications:** This study shows that although the laboratory course prepares students for the CP-IPPE in various ability areas, additional improvements in the course are needed to better prepare students for CP-IPPE in the NC.

**Student and Preceptor Perceptions of and Experiences With an Interprofessional Systems-Focused IPPE.** Mitra Assemi, *University of California, San Francisco*, Valerie B. Clinard, *University of California, San Francisco*. **Objectives:** To evaluate student and preceptor perceptions of and experiences within pilot, systems-focused, interprofessional (IPE) IPPE. **Method:** Fourteen first-year pharmacy/medical student pairs were placed across 6 different health systems-based service lines for a longitudinal systems-focused IPPE from January – May 2016. Participants were surveyed using instrumentation tailored to the role of preceptor or student. Survey items included perceptions of IPE-related aspects (drawn from previously published literature) the experience itself, and open-ended feedback. A 5-point Likert scale was used for response options. Data analysis included descriptive and analytical statistics and qualitative analysis of comments. **Results:** Twenty-four students (12 P1, 12 M1; 85.7% response rate) and 11 practitioners (9 pharmacists, 2 physicians; 100% response rate) consented and completed the survey. Students reported participating in a variety of different activities during the experience. Both groups highly rated the overall value of the experience (student mean = 4.04, STD = 1.7; preceptor mean = 4.64, STD = 0.48). Students (mean = 4.5; STD = 0.7) and preceptors (mean = 4.9; STD = 0.3) expressed high levels of agreement regarding the benefit of IPE experiential learning and practice towards preparation for future

interdisciplinary team-based practice. Preceptors expressed higher levels of agreement that the students' work/efforts over the rotation contributed positively to the daily workload and/or services provided at the site (preceptor mean = 4.7, STD = 0.4, for both pharmacy and medical students, respectively; student mean = 3.8, STD = 1.1). **Implications:** Experience with this pilot IPPE will inform future IPE experiential-related coursework.

**Student-Driven Practice Management Activities to Enhance Community Pharmacy and Ambulatory Care APPE.** Caitlin Frail, *University of Minnesota*, Kylee Funk, *University of Minnesota*, Keri D. Hager, *University of Minnesota*, Amy L. Pittenger, *University of Minnesota*, Jean Y. Moon, *University of Minnesota*. **Objectives:** To increase consistency in practice management topics covered during community pharmacy and ambulatory care (CPAC) APPEs, and assess the impact of sharing student experiences across sites. **Method:** Five practice management modules were developed by clinical practice faculty with input from volunteer preceptors. Topics were selected based on a survey of preceptors on the most critical content for CPAC practice, and included: billing and payment, medication safety, care models, quality measures, and interprofessional care. Assignments required students to read, reflect, and discuss with their preceptor. Through the learning management site, students posted on a discussion forum and responded to classmates to compare and contrast experiences. Surveys assess contribution to learning, benefit from other students' experiences, and sense of community on the online forum. **Results:** In 2016, 100 students completed the CPAC curriculum. Response rate was 71% ( $n=40$ ) for summer semester, and 50% ( $n=22$ ) for fall semester. Students generally felt the assignments contributed to their learning on rotation (66%), and the majority felt it was helpful to learn from students at different rotation settings (e.g. community versus ambulatory care; 55%) and sites (e.g. one community pharmacy versus another; 61%). Fewer students found it valuable to interact with their classmates online during rotation (43%). **Implications:** Students saw value in completing standardized practice management assignments and learning from other students' sites and experience, but did not experience a sense of community with classmates through online forums. A more intentional design to facilitate interactions may enhance a sense of community in the future.

**The Ever Changing Evaluation Process for Pharmacy Student Rotations.** Janet H. Cooley, *The University of Arizona*. **Objectives:** Describe the modes of assessment used to update pharmacy student rotation evaluation tools. **Method:** Focus groups of students were used to evaluate the "Student Evaluation of Preceptor and Site" (SEP) tool. Preceptor surveys were used to evaluate the "Preceptor Assessment of Student" tool (PAST). Data from the updated PAST was analyzed using a Rasch analysis to test the scale and the fitness of the questions. A quality assurance process was developed that included review of findings from the SEP and PAST at every rotation to identify concerns of students or preceptors. **Results:** Students indicated in the focus groups that they were often unwilling to be honest on SEP. The tool was adapted to reflect student comments and students were instructed to contact the Experiential Education team with any concerns that they were not comfortable sharing in SEP. The preceptor surveys demonstrated that the existing PAST was acceptable with minor improvements. The Rasch analysis showed that PAST had acceptable reliability and validity but questions can be added to help differentiate levels of learners. **Implications:** The evaluation of the SEP and PAST established that they are acceptable but not perfect. Both learners and preceptors develop personal relationships that make feedback and honesty a challenge. Future goals to improve the process include

reframing PAST with Entrustable Professional Activities. The key is to view the development of evaluation tools for students and preceptors as an evolutionary process that is never finished.

**The Impact of Introductory Pharmacy Practice Experiences and Course on Students' Future Interests.** Amber Verdell, *West Coast University*, Diem Thai, *West Coast University*. **Objectives:** To determine if the selective Introductory Pharmacy Practice Experience 3 (IPPE3) course affects APPE or future career interest of third year students. **Method:** IPPE3 is third-year Doctor of Pharmacy course that includes 12 weeks of didactic and 3 weeks of experiential learning. During the didactic component, students are introduced to all 3 practice areas. Students have the option of choosing home infusion, specialty, or long-term care pharmacy for the experiential component. An anonymous survey was distributed to students prior to the course and after their rotation to assess the impact of this IPPE course offering on APPE preference and future career interest. Descriptive statistics were used to analyze survey data. **Results:** The response rate was 100% and 88% for the pre- and post-course surveys, respectively. Students reported interest in selecting home infusion pharmacy APPEs pre- and post-course as 74.3% vs 73.7%, specialty pharmacy APPEs pre- and post-course as 97.3% vs. 80.8%, and long-term care pharmacy APPEs pre- and post-course as 75% vs 87.5%. Students reported interest in working after graduation in home infusion pharmacy pre- and post-course as 70.6% vs 62.9%, specialty pharmacy pre- and post-course as 94.5% vs 73.1%, and long-term care pharmacy pre- and post-course as 71.4% vs 80%, respectively. **Implications:** IPPE3 was developed to expose students to developing areas of practice for pharmacists. Students reported high levels of interest in selecting APPEs and working in these areas after graduation.

**Using APhA Career Pathway Evaluation Program to Aid students in Choosing APPE Rotations and Beyond.** Sandra W. Rosa, *Albany College of Pharmacy and Health Sciences*, Laurie L. Briceland, *Albany College of Pharmacy and Health Sciences*. **Objectives:** The Career Pathways Program was utilized to make students aware of the many pharmacy-focused careers available while taking into account their personal and professional preferences. By researching the pathways revealed by their results, students would be able to learn the requirements for each and tailor their rotation selections and future career plans accordingly. **Method:** During the APPE Orientation Course, P3 students were required to complete the APhA Career Pathway Evaluation. When presented with the results, students researched the six pathways that corresponded to their critical factors, then wrote a short essay answering the following questions: Will this information help you select your rotations, did this exercise affect your postgraduate career plans, has this exercise changed your plans in terms of pursuing a residency and/or advanced degree? **Results:** 229 students completed the exercise. Students overwhelmingly (77.5%) agreed that this program would inform their APPE selections due to the increased awareness of the different career pathways. Interestingly, only 37.6% stated that this would affect their future career plans and 23.8% indicated that they changed their minds about pursuing ( or not pursuing) and residency or advanced degree. Ambulatory care was the prevalent career pathway in the overall results. **Implications:** The APhA Career Pathway Program is a useful tool to aid students in clarifying their goals for the immediate future ( choosing rotations) but was less impactful in determining a postgraduate career trajectory.

**Utilizing Preceptor Interests and Preferences in Developing a Structured, Longitudinal, Preceptor Development Program.** Jane Shtaynberg, *Long Island University*, Dena Shaheen, *Long Island University*, Anna Nogid, *Long Island University*. **Objectives:** To

identify preceptor interests and preferences to guide the development of structured, longitudinal, preceptor development program. **Method:** A 51-item survey tool was developed to identify interests and preferences of preceptors at our institution. The survey instrument consisted of four sections: background information, topics of interest (rated on a 4-point scale with 1 = not interested and 4 = very interested), delivery format, and comments. All active preceptors were invited to participate. Descriptive statistics were used to analyze data. **Results:** Out of 394 preceptors, 180 completed the survey. Approximately half of the respondents indicated that they precepted students for < 5 years (52%), 48% of respondents practice in a community setting, and 48% precept students from other schools of pharmacy. Overall, the topics of most interest included effective communication in the experiential setting (mean = 3.43), teaching clinical problem solving (mean = 3.39), and setting expectations (mean = 3.35). Topics of least interest included understanding cultural diversity (mean = 2.88), guiding students through research (mean = 2.87), and teaching portfolios (mean = 2.77). Effective communication was of high interest to preceptors across all practice settings. Interest level for other topics varied depending on practice setting. Preceptors preferred online delivery (69%) to live workshops/seminars (29%), one or more programs per year (68%), and receiving CE credit (51%). **Implications:** Preceptors' interests and preferences for the delivery and format of programs varies. A structured, longitudinal preceptor development program should include a diverse array of topics and delivery methods to appeal to varying preceptor preferences.

#### Theoretical Models

**A Longitudinal APPE at The Cleveland Clinic – Pilot Year One Design and Implementation.** Erin L. Johanson, *Roseman University of Health Sciences*, Darla Zarley, *Roseman University of Health Sciences*, Catherine Oswald, *Roseman University of Health Sciences*, Phillip Lawrence, *Roseman University of Health Sciences*. **Objectives:** The purpose of this study is to describe a novel longitudinal Advanced Pharmacy Practice Experience (APPE) design hosted at The Cleveland Clinic hospitals and clinics for PharmD students in the final year of their curriculum. **Method:** PharmD students were given the opportunity to complete all APPE rotations at the Cleveland Clinic for their final year of pharmacy school. Interested students submitted applications including essays and curriculum vitae. The experiential team reviewed IPPE feedback, eligibility, and fit, selecting students to be interviewed by a panel including two APPE coordinators, two clinical pharmacists who hold positions on residency advisory committees, and the Associate Dean of Academic Affairs using a rubric. Candidates with the highest rank after interviews were invited and assigned rotations in the Cleveland Clinic system based on interest and availability. **Results:** 35 complete applications received, 24 interviews conducted, and 10 students accepted to participate in APPEs at The Cleveland Clinic for the academic year. **Implications:** The opportunity to incorporate the culture of the Cleveland Clinic's pharmacy practice with APPE rotations learning activities is a novel learning design for students and preceptors. Since this initial pilot, other large health care institutions inquired about designing similar longitudinal APPEs. Benefits are widespread, including greater continuity of care, long-term projects, and incorporation of students into direct patient care in an ongoing basis for mutual benefit and student development as well as challenges of financial and emotional costs living away from the COP. Further assessment is needed for ongoing improvement and replication.

**Centrally Delivered Curriculum to Create Consistency in Community Pharmacy and Ambulatory Care APPEs.** Jean Y. Moon, *University of Minnesota*, Caitlin Frail, *University of Minnesota*. **Objectives:** To describe the development of a centrally-managed

online curriculum to promote consistency and complement on-site learning during community pharmacy (CP) and ambulatory care (AC) APPE rotations. **Method:** Ensuring consistency and quality in student learning experiences during APPE can be challenging, particularly in a volunteer preceptor model. Course directors overseeing CP and AC APPE rotations worked with stakeholders to identify gaps in student experiences across sites in these core required experiences, and subsequently created a structured curriculum delivered through a learning management system. Curriculum was intentionally designed and implemented to complement on-site clinical learning by requiring content not consistently covered on site. **Results:** Core areas that were considered critical and not consistently addressed by sites included: evidence-based medicine (e.g. having journal clubs, using the PICO model), practice management (e.g. discussing quality measurement, understanding payment issues), case presentations, and cultural competency. Activities were developed to address these topics and managed centrally online by course directors and clinical faculty. The format was intentionally designed to drive peer-to-peer interaction through peer reviews and discussion forums in an attempt to allow students to learn from other sites, settings, preceptors, and perspectives. **Implications:** CP and AC have similar APPE outcome goals and can be synergistically combined to create a CPAC curriculum that promotes consistency and promotes sharing across rotation sites to enhance learning outcomes.

**Development of a Model for Student Engagement in a Practical Research Experience.** Branden D. Nemecek, *Duquesne University*, Jordan R. Covvey, *Duquesne University*. **Objectives:** To describe a framework for faculty to engage students in collaborative research projects through advanced pharmacy practice experiences **Method:** A 10-week, 2-block experiential rotation focused on practice-based research was offered to final year pharmacy students. The goals were: (1) student development in preparation for residency training, (2) integration of faculty goals for promotion/tenure through student learning, and (3) joint engagement of clinical and research faculty to produce practical outcomes. A total of three practice-based research projects were designed by faculty to be executed at an affiliated academic medical center. In addition to research execution, students participated in topic discussions on ethics, human subject protection, protocol/abstract development and biostatistics. Student perceptions of outcomes were assessed via survey questionnaire at the end of the experience. **Results:** A total of 15 students voluntarily engaged in the rotation under joint supervision of four faculty members (three in acute care, one in social/administrative research). All three projects were achieved during the experience, with all three abstracts later presented in poster form by students at a national meeting. Approximately two-thirds of students indicated that prior to the rotation, they had very little knowledge/experience in executing practice-based research. However, as a result of the rotation, nearly all students indicated increased comfort, confidence and knowledge in this area, as well as desire to engage in practice-based research in their future career. **Implications:** Advanced pharmacy practice experiences can serve as a useful opportunity for students to engage in practice-based research, while simultaneously helping to achieve faculty goals in scholarship and mentoring.

**Maximizing Your Clinical “Village” to Provide Innovative Student Institutional Health System (IHS) Experiential Experiences.** Elizabeth Trolli, *The Ohio State University*, Sara Jordan, *Grant Medical Center*, Elise Weyrauch, *Grant Medical Center*, Halle Orlinski, Donald Sullivan, *The Ohio State University*, Timothy Smith, *Grant Medical Center*. **Objectives:** To create dynamic clinical experiences

for PharmD students at a Level 1 Trauma community hospital by maximizing the clinical pharmacy team, allowing for multiple preceptors to contribute to the diverse patient care learning experiences for IHS hours. **Method:** The Ohio State University College of Pharmacy (COP) partnered with Grant Medical Center (GMC) to create quality learning experiences for students by utilizing multiple preceptor team members to complete the 40 hour rotation. By collaborating with various pharmacists for these experiences, individual preceptor burden is decreased to 4 hour blocks of time. This unique rotation is offered in a modular format with 7 different student experiences available. Individual student need is better tailored by allowing a more customized training approach. The GMC rotation offers students an introduction to the institutional health system setting using an online modular student self-scheduling approach. This a la carte mechanism allows for student flexibility in scheduling as only 4 of the 7 experiences are required and provides students with the freedom to explore areas of interest and find new passions through self-selected rotations. **Results:** The GMC rotation provides a framework with flexibility for both student and clinical preceptor. Student and preceptor feedback from this experience has been overwhelmingly positive and yearly updates continually strengthen the experience. **Implications:** Colleges and schools of pharmacy can use this method to partner with local hospitals to obtain clinical experiences for students. This will help engage a larger preceptor pool and decrease burden by sharing the experiential experiences within the clinical team.

**The Use of Simulation to Improve IPPE-1 Performance.** Jane H. Condee, *University of Charleston*, Julie A. Testman, *University of Charleston*. **Objectives:** The innovative use of the MyDispense community simulation software in conjunction with pharmacy dispensing software introduces students to the processes necessary to be prepared for community pharmacy practice rotations. Our main goal is to provide those students without prior community pharmacy experience the opportunity to gain knowledge and confidence prior to their first rotation. A secondary goal is to reduce the training burden for our community preceptors. **Method:** Students scheduled for IPPE-1 rotations participate in three longitudinal simulation labs prior to their first rotation. The first lab introduces the MyDispense and dispensing software using Top 200 medications. In lab two, students complete a set of MyDispense cases, transcribe recorded prescriptions, and take a verbal prescription which they dispense. In lab three, students complete MyDispense cases, take a verbal prescription, dispense the prescription and counsel the patient. **Results:** We have found that most of our P-1 students have little or no prior pharmacy experience. Having the opportunity to learn the skills and processes encountered during a community rotation, provide students with added confidence to be successful. Preceptors are able to spend more time working with students on pharmacist’s responsibilities and duties rather than operational basics. **Implications:** The use of simulation activities provide community practice experience in a “safe” environment where students receive immediate feedback. By using a combination of the MyDispense and dispensing software, students have the opportunity to experience multiple scenarios including using Top 200 and over-the-counter medications. The successful completion of the simulation labs provides students with basic knowledge for their first rotation experience.

**Utilizing a Student Mentorship Program to Facilitate Student Housing Support While on Experiential Rotations.** Anita J. Clevon, *Pacific University Oregon*, Jeremy Hughes, *Pacific University Oregon*, Jackson Ross, *Pacific University Oregon*. **Objectives:** To create a student-led program that supports students in their efforts to find housing for experiential rotations while minimizing the need for both

administrative support and program exposure to legal liability. **Method:** Discussions were started between the Offices of Experiential Education (OEE) and Student Affairs (OSA) to identify methods to help students find housing when moving for clinical experiences. Current and past students were surveyed electronically and interviewed via focus groups to determine information and attitudes about past housing searches. Trends were identified, including: geographic zones requiring similar types of support, successful and unsuccessful methods for finding housing, and methods of communication preferred by students. **Results:** A Housing Mentor program was developed and implemented where a student mentor serves as a central resource for information regarding housing in a particular geographic zone. This student manages communication and information including students scheduled to rotate in the region, successful housing strategies, preceptors and alumni who provide housing, and additional housing opportunities. Information about the program was disseminated to students electronically and through presentations after students learned of their experiential assignments. Housing Mentors were chosen by the OEE and OSA based on a review of student applications and were assigned to the most frequently used zones. **Implications:** A student-led method for facilitating students' housing search during experiential rotations can be effective to minimize both administrative support and legal liability for the program.

## **LIBRARY AND INFORMATION SCIENCE** **Completed Research**

**Assessing Community Pharmacy Preceptors' Barriers to Obtaining and Providing Medication Information.** Sandra Bai, *Purdue University*, Amy H. Sheehan, *Purdue University*, Robert D. Beckett, *Manchester University*, Joe Jordan, *Butler University*. **Objectives:** The objective of this project is to assess community pharmacy preceptors' confidence in responding to medication questions and identify potential barriers that community pharmacists encounter when collecting, assessing, and communicating medication information to patients and healthcare professionals. **Method:** The assessment instrument consisted of 19 items and was designed to collect information about pharmacists' confidence in responding to medication questions, including collecting, assessing, and communicating medication information. Barriers that may impact the pharmacists' ability to answer medication information questions were also included. A total of 443 community pharmacy preceptors affiliated with Butler, Purdue, and Manchester universities were contacted via e-mail and invited to complete the assessment. **Results:** The response rate was 28.4% (n=126/443), with most responders (69%) practicing in a retail chain or a grocery store pharmacy. Responders reported answering an average of 26 medication questions per day in person or over the phone. The majority strongly agreed that they were confident speaking with patients (62%) and health professionals (51%). However, a smaller percentage strongly agreed that they were confident in evaluating internet sites (33%), assessing tertiary resources (18%), and interpreting results to clinical studies (21%). One-third of responders lacked access to Micromedex (33%), Lexicomp (33%), and MEDLINE/PubMed (29%). Lack of time was ranked as the barrier with the largest impact on providing responses to medication information questions (64%). **Implications:** These results provide insight into barriers community pharmacists must address to successfully implement the Pharmacists' Patient Care Process, including, potential targets for advancement of experiential education and community pharmacy practice.

**Assessment of Active Learning Activities to Teach 2nd Year Pharmacy Students How to Use PubMed.** Priya Shenoy, *Drake University*. **Objectives:** To determine if introducing PubMed through active learning activities resulted in student comprehension of content in 2nd-year pharmacy students in a skills-based course. **Method:** Instruction was given via required pre-class videos and an in-class lecture. The assessment was performed through a pre-class quiz, a lab assignment, and final exam questions. Students watched three videos totaling 17 minutes on PubMed regarding Medical Subject Headings (Mesh), the Search Details box, PubMed vs. Google Scholar, and the accessing and saving of articles and searches, and combining searches in PubMed. This was accompanied by a mandatory quiz to assess student retention and comprehension of video content. Lecture consisted of a brief review of key points, common mistakes, and work on a moderately difficult search. During the one-hour lab session, students were given two case studies to investigate in PubMed. **Results:** Students scored an average of 18.78/20 on the pre-class PubMed quiz. Students scored an average of 15.4/16 on the PubMed lab cases. The five final exam question scores ranged from 94.17%-96.12% correct. Areas where students struggled included applying filters to select the correct article type specified, utilizing MeSH, accessing articles, and understanding the publication process. **Implications:** Active learning activities that focused on understanding key PubMed searching concepts and case-based studies helped increase 2nd-year pharmacy students comprehension of searching PubMed.

**Comparison of Drug Information Reference Education Via Recording or Interactive Lesson on Student Knowledge Retention.** Christopher S. Wisniewski, *Medical University of South Carolina*, Melissa Hortman, *Medical University of South Carolina*. **Objectives:** To assess the efficacy of using the interactive lesson in Moodle on student performance and retention. **Method:** In a drug information (DI) course, students are taught standard DI topics, including DI references. A Moodle lesson was developed to determine the efficacy of this teaching method. Students were randomized to receive education via the lesson or a recorded lecture. Students completed a baseline knowledge assessment, an assignment following instruction, and the same baseline assessment at the end of the semester to assess retention. Students completed a survey on their experience with the assigned education technique. The differences of average grades on assessments and survey results between groups were compared via descriptive statistics. **Results:** Student performance on the assessment was comparable between groups (n = 40 per group) at baseline (49.17% vs. 50.49%). Retention of knowledge was less in students in the lesson group (67.17%) than in the lecture group (69.94%). Students taught by lecture performed better (88.86%) than those taught by lesson (83.73%) on the post-instruction assignment. Survey results from participants (n = 32/80) showed more students in the lecture group (n = 16) agreed time associated with educational technique was reasonable (69% vs. 31%), technique was valuable to learning (75% vs. 44%), and experience was satisfying (56% vs. 31%). **Implications:** Students were not better able to retain information taught via a Moodle lesson in comparison with a recorded lecture. Student performance was better immediately following education when taught by lecture. More lecture-taught students agreed the educational technique was time-appropriate, valuable, and satisfying.

**Impact of a Video Presentation Assignment on Student Confidence in Presenting Evidence Based Medicine.** Brekk A. Feeley, *University of Wisconsin-Madison*, Amanda Margolis, *University of Wisconsin-Madison*, Sara Shull, *University of Wisconsin-Madison*. **Objectives:** To assess the impact of a video presentation assignment on

student confidence in presenting evidence based medicine to hypothetical healthcare professionals with varying credentials. **Method:** Pharmacy students enrolled in a required drug literature evaluation course were assigned to video record a verbal summary of a clinical trial for a hypothetical physician. To determine the effect of the assignment on confidence, students voluntarily completed a pre/post online survey consisting of 15 questions. Confidence levels were rated on a 5-point scale (1 = no confidence; 5 = complete confidence). Survey questions explored confidence in presenting and discussing the trial and making verbal and written recommendations for medication use based on evidence to both peers and healthcare providers. Students who completed the survey received extra credit. Wilcoxon Signed-Rank Test was used to determine the statistical significance of change in confidence. **Results:** In a class of 127, both the pre-and post-surveys were completed by 112 students (88%). Confidence improved within each question from pre to post survey ( $p < 0.001$ ). The cumulative confidence score increased by 25% from baseline ( $p < 0.001$ ). When making verbal recommendations to pharmacists there was a 28% increase in confidence with a final score of 2.99 ( $p < 0.001$ ). When making verbal recommendations to other healthcare professionals there was a 26% increase in confidence with a final score of 2.79 ( $p < 0.001$ ). **Implications:** After completing the video assignment, students gained confidence in presenting evidence. A future direction includes determining whether the changes in confidence are directly related to the specific assignment.

**Showcasing Pharmacy Student Research Projects in a Collection of a University Campus Repository.** Jennifer R. Martin, *The University of Arizona*, Marion K. Slack, *The University of Arizona*, Alejandra Aguilar, *The University of Arizona*. **Objectives:** To describe the use and impact of a campus repository for storage of research posters and papers of graduate pharmacy students. **Method:** To increase access to information, the research project coordinator and the pharmacy librarian proposed to make this information accessible and retrievable, as well as searchable by placing them into the campus repository. To increase access to reports based on student research, meetings were conducted with the director of the repository and the collection was developed including how information was portrayed and included. Site statistics were collected a month after the initial deposits and repeated every 3 months. **Results:** The collection's site statistics were gathered for both the collection and individual records. Statistics revealed that views and usage over time has increased. Over the last 8 months the number of downloads and views have increased steadily. One month after initial deposits, site statistics revealed any records viewed in the collection was 298 times and 22 full text items were downloaded. Currently any items in the collection has increased to 2336 views and a total of 200 downloads. Only 6 full text items are presently included in the repository and abstracts of projects from Classes of 2010 through 2016. **Implications:** Collaborating with your local campus repository can showcase student research projects, provide availability and accessibility to abstracts and research reports from anywhere in the world. Not only can it make items searchable and retrievable from any search engine, but also can increase the impact of student research.

### Theoretical Models

**Building a Legacy for Tomorrow: A Collaboration Model to Support Robust Digital Archives.** Shannon R. Tucker, *University of Maryland*, Na Lin, *University of Maryland Baltimore*, Patricia Hinegardner, *University of Maryland Baltimore*, Rebecca J. Ceraul, *University of Maryland*. **Objectives:** The objective of this project was to establish a collaboration model supporting the collection of institutional history to create a permanent and enduring legacy for the future. **Method:**

Maintaining a robust historical archive has become more challenging as artifacts shift from a physical to digital form. Physical documents that could be physically packaged and sent to archivists have become ephemeral in today's digital environment. To prevent losing history, the HSHSL partnered with the School Offices of Academic Affairs (OAA) and Marketing and Communication (M&C) to 1) identify digital sources of historical importance for the UMB Digital Archive, 2) establish a permanent repository for scholarly output, and 3) develop a seamless collection process. **Results:** Through this dynamic collaboration, the School's collection in the UMB Digital Archive has grown 21%. This increase was supported through the expansion of traditionally archived material to include scholarly publications by faculty and students, dissertations, email newsletters, and other historically important digital communication. To pilot archiving of scholarly work, OAA and HSHSL strategically archived faculty and student posters for the 2014 & 2015 AACP annual meetings providing open and institutional access to pharmacy education research. Further discussions established web-based and email collection methods as a primary source of new materials. Collaboration has extended to include reciprocal work on the School 175th anniversary and experimental techniques to store web-based academic catalogs. **Implications:** The active participation of the School has been instrumental in the continued growth of the pharmacy collections within the Archive. This success provides a model for UMB and beyond.

**Ensuring Quality in Online Graduate Education Using the Quality Matters Rubric.** Shannon R. Tucker, *University of Maryland*, James E. Polli, *University of Maryland*, Andrew Coop, *University of Maryland*, Mary Jo Bondy, *University of Maryland Baltimore*, Matthew Rietschel, *University of Maryland School of Nursing*. **Objectives:** To ensure quality online graduate education at the University of Maryland Baltimore (UMB). **Method:** The Masters of Science (MS) in Regulatory Science at the University of Maryland School of Pharmacy adopted the Quality Matters (QM) self-review and official QM Course Design Review process to ensure consistent course quality throughout the program's curriculum. The Regulatory Science program worked with the UMSOP Office of Academic Affairs and QM Coordinator(s) at the University of Maryland School of Nursing to complete QM training and course design/redesign consultations to meet the rubric's quality standards and achieve certification. The subsequent creation of the UMB Office of Academic Innovation and Distance Education provided an opportunity to adopt QM as a common quality metric. **Results:** Incorporating QM into the program's course design process and committing to certify all graduate courses (60% certified by 2016), the Regulatory Science has ensured consistent course quality. Coupled with the UMB adoption of QM as a consistent quality measure for all new online graduate courses a common language and expectation for online education and faculty development. This has ensured UMB is positioned to meet emerging University System of Maryland (USM) guidelines on online accessibility based in part on QM standards. **Implications:** Programmatic use of the QM rubric provides a method to align courses with current practices in educational theory, assessment, instructional materials/technology, student-centered learning, and accessibility/usability. As national emphasis focuses on online education's ability to meet the needs of diverse populations, the QM standards provide a mechanism to situate educational statutes in a practical framework.

### PHARMACEUTICS Completed Research

**A Novel Microenvironmental Targeting Liposome for the Treatment of Multiple Myeloma.** Fangzheng Yuan, *St. Louis College of Pharmacy*, Cinzia Federico, *Washington University in St. Louis School*

of Medicine, Noha N. Salama, *St. Louis College of Pharmacy*, Abdel Kareem Azab, *Washington University in St. Louis*. **Objectives:** Multiple myeloma (MM) is a hematologic malignancy of plasma cells accumulating in the bone marrow (BM). Interaction of MM cells with the BM microenvironment induces resistance to chemotherapy. The study explored development of a novel liposomal formulation containing two bioactives: AMD3100, which disrupts the interaction of MM cells with the tumor microenvironment, and Bortezomib, a cytotoxic agent; in order to explore the potential synergistic therapeutic benefit. **Method:** Liposomes were composed of DPPC/Cholesterol/PEG2000PE (6:3:1 molar ratio) and prepared by Thin Layer Evaporation technique, followed by extrusion by a Mini Extruder™. Physical parameters were determined by dynamic light scattering analysis. The loading capacity was determined by HPLC. Cytotoxicity of colloids was evaluated by MTT-testing after 48 and 72 h. **Results:** All formulations were in the range of 150nm and a polydispersity index of  $\geq 0.1$  with -25mV surface charge, which represent suitable features for systemic administration. The loading capacity was high for both drugs (~80%). AMD3100 co-encapsulation with Bortezomib within liposomes significantly reduced cell viability after 48 and 72h, compared to the single-drug loaded liposomes or the single or combined drugs in non-liposomal formulations. The unloaded liposomes did not induce cytotoxicity. **Implications:** The successful liposomal encapsulation of two therapeutic agents that are different in pharmacological and physical properties opens a new frontier in drug delivery, and promises advances employing this therapeutic synergism in concurring cancer therapy challenges. The promising in-vitro evaluations reported herein for this novel liposomal formulation constitute the foundation and enable the launch of further in-vitro and in-vivo efficacy studies.

**Accuracy of Pharmacy Students' Compounded Vancomycin Solution.** Erika M. Cretton-Scott, *Samford University*, Danielle L. Cruthirds, *Samford University*, Angela R. Thomason, *Samford University*, Lori Coward, *Samford University*. **Objectives:** To assess the accuracy of pharmacy students' compounded product. **Method:** Third year pharmacy students enrolled in a required Introductory Pharmacy Practice Experience (IPPE) in 2015 (n=105) and 2016 (n=133) participated in a hands-on laboratory exercise designed to assess their compounding skills. Students were given a formula for the preparation of an oral vancomycin solution that was subsequently analyzed for accuracy using High Performance Liquid Chromatography (HPLC). As part of the exercise, students were asked to show their calculations and document steps taken in preparing the solution, i.e. completing a compounding record. This study was approved by the institution's IRB. **Results:** All students enrolled in the IPPE completed the exercise. On average, the percent accuracy of the compounded vancomycin solution was within 10% of the targeted concentration for 73.5% of solutions analyzed (n= 238) with an average percent error that ranged from 4.45% to 4.77%. In reviewing students' compounding records (n=172), only 24% contained sufficient details to ensure that another person could reasonably duplicate the procedure whereas 43% of the records had minimal details, limiting the ability of another person to duplicate the procedure. **Implications:** Incorporating analytical assessments of students' compounded products has the potential to increase student awareness and understanding of the relationship between quality of compounded products and patient safety. Adding the compounding records into the assessment can provide students a mechanism to identify sources of error to improve their compounding skills.

**Active Roles of AAPS Student Chapters on Engaging PharmD Students in Pharmaceutical Sciences.** Uyen Le, *Sullivan University*, Duc P. Do, *Chicago State University*. **Objectives:** To demonstrate

evidence of active roles of the American Association of Pharmaceutical Scientists (AAPS) student chapters on students' engagement in pharmaceutical science activities at teaching-intensive colleges of pharmacy (COPs). **Method:** We collected and quantitatively analyzed data related to scholarship, teaching, and services of AAPS members in pharmaceutical sciences in 2010-2016 at COPs from Sullivan University and Chicago State University. **Results:** In the aspect of scholarship, AAPS students were annually authored/co-authored of 8 out of 10 publications (articles and abstracts) resulting in an average of 80% of publications. Thirty-seven percent of publications were initiated by the chapter advisors, and 74% were performed through students' APPE rotations. To get better understanding, we broke down the publications by disciplines and observed that pharmaceuticals contributed the most (37%), pharmacology the second (35%), and medicinal chemistry in the last position (28%). In addition, we observed significant activities in the domains of teaching and services, where pharmaceuticals and compounding subjects are major contributors to student scientific engagement. Particularly, faculty advisors annually facilitated around 21 APPE rotations relating to pharmaceuticals, 2 compounding competitions, several pharmaceuticals educational exhibitions for kids, and 2 field trips to a compounding pharmacy or a pharmaceutical/biomedical company. Finally, as a result, the chapters obtained approximately \$2,500/year from the AAPS organization to support these activities. **Implications:** The AAPS chapters play an important role in engaging students in pharmaceutical sciences, especially in teaching-intensive pharmacy colleges with no graduate programs. Such data from other chapters of 61 COPs, including 10 similar teaching-intensive institutions, will be collected for further analysis.

**An Overview of Point-of-Care Testing (POCT) Laboratory Course at a Doctor of Pharmacy Program.** Aladin A. Siddig, *University of Charleston*, Gannett Monk, *University of Charleston*, Ron Ramirez, *University of Charleston*, Mina Asanasious, *University of Charleston*, Aymen Shatnawi, *University of Charleston*. **Objectives:** This innovative laboratory course introduced the concepts and processes associated with Point-of-Care Testing (POCT). The major goal was to provide well-integrated, detailed coverage of general principles of POCT, focusing on the National Association of Chain Drug Stores (NACDS) guidelines for POCT in the Doctor of Pharmacy curriculum. **Method:** The POCT Laboratory is a one-credit hour core course that is open to first year PharmD. students. The lab is structured into three major areas of emphasis. Initially, the introduction of key foundational concepts of physical assessment. Second, gaining hands-on experience obtaining various types of patient samples. Lastly, laws and risk management targeting the development of a POCT testing service, testing limitations, and CLIA regulations. **Results:** The mean course evaluation for the 58 students in the fall of 2016 was 4.2 on a Likert scale anchored at Strongly Disagree (1) and Strongly Agree (5). Student comments were constructive and generally good. Students demonstrated mastery of the material taught, with 33% receiving an A, 57% receiving a B, and 10% receiving a C in the course. **Implications:** This laboratory course of study reflects the trend toward pharmacy's increased role in the healthcare landscape, utilizing both basic science and clinical applications. We hope that by introducing this certificate program in the first year, students understand these emerging expectations, and will utilize these skills to positively impact patient care earlier.

**Assessment of Student Perception of Several Instructional Approaches Utilized in a Pharmacokinetics Course.** Sam Harirforoosh, *East Tennessee State University*. **Objectives:** The goal of this study was to evaluate the perceived effectiveness of four approaches used

to enhance learning outcomes in a kinetics course. **Method:** Pharmacokinetics and Pharmacogenomics is a required four-credit hour course offered to P2 pharmacy students at Gatton College of Pharmacy, East Tennessee State University. The course consists of a series of lectures covering various pharmacokinetic topics. In order to enhance student understanding of kinetics, several additional techniques including Process Oriented Guided Inquiry Learning based in-class exercises, a computer-based technology containing pharmacokinetics assignments and practices, TurningPoint technology, and Microsoft Office Excel were utilized. Questions included in anonymous summative surveys using a 5-point Likert scale (1-Strongly Disagree to 5-Strongly Agree), conducted by the Academic Affairs office and completed by six groups of students from 2011 to 2016, were used to evaluate students' satisfaction concerning each element. The project was determined by the local Institutional Review Board to not be defined as human subject research. **Results:** Out of 483 students, 296 (61%) responded to surveys. The majority of students agreed or strongly agreed that in-class exercises enhanced their ability to learn pharmacokinetic concepts (88%) and the use of pharmacokinetic computer-based technology facilitated their learning of pharmacokinetics (86%). However, fewer students agreed or strongly agreed that the use of clicker questions encouraged in class participation (56%) or Microsoft Excel increased kinetics problem solving ability (53%). **Implications:** Data obtained from this project indicates that, of the approaches examined, in-class exercises and online assignments are more effective in teaching pharmacokinetics based on student feedback.

**Bibliographic Coding and Integration of a Librarian Into Pharmaceutics Course Content.** Amy J. Chatfield, *University of Southern California*, Rebecca M. Romero, *University of Southern California*, Zoe Folchman-Wagner, *University of Southern California*, Ian S. Haworth, *University of Southern California*. **Objectives:** To demonstrate adherence to ACPE standards calling for critical analysis and application of primary literature and relevant information resources, course faculty and a librarian collaborated to improve the quality and volume of cited material in a long-running, case-driven problem-based learning course. **Method:** An approach was devised to provide instruction to improve student discovery and retrieval of information related to pharmaceuticals and drug delivery. There was no existing way to measure this improvement; therefore, a new methodology based in bibliometric coding was created. Student case study assignments from 1996 through 2016 were coded to assess type of material used. **Results:** Collaboration between different professionals increased the quality and depth of the education provided to students. Analysis of cited items showed an increase in both the number of citations and quality of cited items. Prior to the collaboration, in 2008, 203 items were cited as sources for case studies and 57 (28%) were articles or conference posters. In 2012, 2 years after the collaboration was launched, 576 items were cited and 252 (43%) were articles or conference posters. In the same timespan and subsequently, citations to monographs, patents, and computer programs have increased, and citations to personal communications and free websites have decreased. **Implications:** Pharmacy education standards require students to access and use high-quality scientific literature and tertiary sources. Collaborating with librarians is a way to integrate this access and use into coursework. The methodology described above offers a way to assess whether students are using preferred information sources.

**Community Pharmacists' Understanding and Perceptions of FDA Bioequivalence Standards.** Brandon J. Euen, *Butler University*, Hala Fadda, *Butler University*. **Objectives:** To evaluate community pharmacists' understanding and perceptions of FDA bioequivalence

standards to identify if further education is needed on this topic. **Method:** An anonymous, 13-item survey was piloted and then distributed by e-mail to a random sample of 163 Indiana community pharmacists. The five-minute survey included demographic, knowledge-based, and perception-based questions that participants were given one week to complete. Participants completed the survey using a Web-based survey tool (Qualtrics). **Results:** 110 pharmacists completed the survey with a response rate of 67.4%. Only 7.2% of respondents were able to correctly identify FDA bioequivalence criteria for approval of generic drugs. 87% of pharmacists correctly indicated that the Orange Book is the location of FDA therapeutic equivalence evaluations. Two questions presented equivalence codes from the Orange Book and asked respondents to identify if a pair of drug products were therapeutically equivalent: 61.1% and 56.6% of respondents answered correctly. 71.8% of pharmacists in this study indicated a positive perception of the rigor of FDA approval standards associated with generic medications and 64.5% believed that generic drug products made by different manufacturers are of similar quality. **Implications:** The results suggest that community pharmacists need additional education on the interpretation of therapeutic equivalence codes and FDA bioequivalence criteria. The safety and efficacy of generics are often questioned by patients and physicians. It is incumbent upon pharmacists to be knowledgeable of FDA bioequivalence standards as they are experts in dosage forms and need to be confident with the criteria to convey to patients and physicians.

**Designing a Required Course of Pharmacogenomics in the First Year of Pharmacy Curriculum.** Marina Galvez Peralta, *West Virginia University*, Grazyna Szklarz, *West Virginia University*, Werner J. Geldenhuys, *West Virginia University*, Paul R. Lockman, *West Virginia University*. **Objectives:** To describe the development of Pharmacogenomics within a new course, Biopharmaceutics and Pharmacogenomics, taken by the first-year pharmacy students that prepares them for system based therapeutic courses in consecutive years. **Method:** The pharmacogenomics section included learning objectives with clinical applications, lectures and team activities. To prepare students to potential challenges of dealing with pharmacogenomics issues with patients, and to improve the learning and applicability on pharmacogenomics, a debate about personalized medicine was conducted by the students (randomly assigned to "against" and "for" groups) at the end of the course. Outcomes and course impact were assessed with tagging exam questions, quizzes, pre- and post-surveys, team activities, and journal reflections. Retention of basic information learned during the P1 course was later measured in the following semester to assess the impact of the course on student learning. **Results:** Seventy-six students were enrolled in the course. 73 students answered the questionnaire. Based on multiple assessments, students' knowledge improved. While at the beginning of the course, 86% of the students considered themselves "unconfident", "somewhat unconfident" or "neither confident nor unconfident" to discuss pharmacogenomics aspects with another healthcare provider or patient, 91% of the students reported being "confident", or "somewhat confident" by the end of the course. This growth on confidence was statistically significant ( $p < 0.001$  Chi-Square analysis). Students showed knowledge retention after six months of taking the course. **Implications:** Implementation of a new course in Pharmacogenomics was well received and prepared students for system-based therapeutics courses further in the curriculum.

**Does Experience Matter? An Experimental Approach to Assessing Compounding Skills.** Deborah L. Elder, *The University of Georgia*. **Objectives:** To analyze and compare compounding skills of pharmacy

students prior to and after a curricular re-design **Method:** Second year (2015 and 2016) pharmacy students were asked to compound salicylic acid (SA) (1mg/mL) aqueous liquids using SA powder or 10 mg SA tablets. An aliquot was removed from each liquid and stored at -20°C. Samples were thawed at RT and a 0.25mL aliquot was transferred to a 25mL volumetric flask and brought to its final volume using distilled water. Using a 1mg/mL SA stock solution, a concentration curve was prepared. Prior to analysis (UV spectrophotometry @ 540nm), 8mL of each dilution was transferred to a glass test tube and allowed to react with 1 drop of ferric nitrate. A concentration curve was constructed and the line equation and R2 were determined using Excel®. Using the line equation, a percent accuracy was calculated for each compounded product. **Results:** The analysis determined, in 2015 (33 consecutive weeks), 19% of all samples were below 70%, 38% were between 70 to 89% and 33% were within the desired 90 to 110 % range (0.0095 to 0.011mg/mL) of accuracy; with approximately 10% above 110%. In 2016 (22 non-consecutive weeks), 26% solution samples were below 70%, 33% were between 70 to 89% and only 16% were within the desired range of accuracy; with 24% of the solutions above 110%. **Implications:** Pharmacy curriculums must allow sufficient opportunities for the development of compounding skills. A significant improvement in accuracy was seen in students with more experience.

**Effect of the Method of Taking Notes on Pharmaceutics Students Assessments.** Steven Sutton, *University of New England*. **Objectives:** Determine whether: not taking notes during Pharmaceutics lecture negatively affects how the student performs on a quiz; and taking hand-written notes positively affects how the student performs on a quiz (vs typing notes onto a laptop). **Method:** Students volunteered to participate in the study during their Pharmaceutics course (n=33). For each of 12 “quiz weeks”, students were randomly divided into three groups: no notes, written, keyboard. This shuffling was repeated for each successive quiz week. During quiz week, lectures were delivered on Monday and Wednesday. “Skeleton” Powerpoint slides were used for illustrative purposes; very little text was on the slides. The Instructor “delivered” the lecture from “lecture notes”. Vocabulary was homework, with Quizlet links. Students were honor-bound to study only with others within their “note-taking group”. On Friday, a ten-question quiz was given on the week’s material. Afterwards the quiz questions and lecture notes were released to the class to study for a retake on Monday. **Results:** The number of times the “no notes”, “written” and “laptop” groups scored best on a quiz was 5, 4, 3, respectively. The CV averaged about 32% for each group. Statistical significance among t-test comparisons was assumed when  $p < (0.05/3)$ . There were no significant differences among the groups. On two quizzes, there was a trend towards “no notes” scoring higher than “laptop notes”. **Implications:** Possibly some students did not study for the Friday quiz, since a retake was offered on Monday. Additional studies are required to determine whether the art of taking notes is alive and worthwhile.

**Evaluation of an Interprofessional Learning Experience and the Impact on Student Perceptions.** Lisa Hong, *Loma Linda University*. **Objectives:** To evaluate how an interprofessional learning (IPL) activity affects student understanding of teamwork, communication, and other professional roles. **Method:** A four-hour IPL experience was designed for students representing various health and social care programs (medicine, nursing, pharmacy, dentistry, physician assistant, master of business administration, child life, x-ray and health information management). This experience consists of a Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) discussion, simulation activities, and clinical cases to facilitate

defining of roles in patient care. Pre and post surveys developed from the Readiness for Interprofessional Learning Scale (RIPLS) were given to each student in order to assess the impact of the IPL on student perceptions. **Results:** Compared with 141 pre-survey responses, a significant increase in post-survey responses indicated agreement with questions regarding teamwork ( $p=0.015$ ) and positive professional identify ( $p=0.002$ ). Answers indicating disagreement with survey questions relating to negative professional identify decreased ( $p=0.052$ ) and there was an increase in answers indicating understanding of professional roles ( $p=0.61$ ); however, these findings were not statistically significant. Comments submitted by students were generally positive along with the request for more IPL opportunities. **Implications:** Additional tools may be necessary to further evaluate the impact of IPL on understanding roles and responsibilities of various professions. Overall, the IPL experience has improved student attitudes toward interprofessional education and collaborative patient care. Future research should evaluate the impact of multiple IPL experiences and the change of student perceptions as well as the effect on patient care when students enter the clinical setting.

**Graduate Student Activity Report: Metrics for Academic Productivity.** Jacqueline McLaughlin, *University of North Carolina at Chapel Hill*, Aaron Todd, *University of North Carolina at Chapel Hill*, Kate Zhang, *University of North Carolina at Chapel Hill*, Antonio Bush, *University of North Carolina at Chapel Hill*, Roy L. Hawke, *University of North Carolina at Chapel Hill*. **Objectives:** The purpose of this work is to describe the design, implementation, and lessons learned from systematically measuring and tracking graduate student scholarly productivity. **Method:** From 2012-2015, the Office of Student Affairs (OSA) at the UNC Eshelman School of Pharmacy administered an electronic survey each semester to all PhD students about scholarly accomplishments. In 2015, the school’s Office of Strategic Planning and Assessment analyzed this data and generated standardized reports using descriptive statistics. Reports were shared with the School’s Graduate Education Committee, division chairs, and included in the School’s 2016 graduate program self-study. The School revised its data collection timeline, instrument, and process in 2016. **Results:** The mean(standard deviation) response rate from 2012-2015 was 85.1(5.0)%. During that period, students reported 212 publications, 53 reviews and book chapters, 62 presentations, 290 abstracts, and 145 fellowship and award applications. Faculty feedback included requests for more comparisons, more specificity on publication authorship, external fellowships, and adoption of an annual collection cycle. In 2016, the response rate increased to 96.4%. **Implications:** AACP has recently placed greater emphasis on graduate pharmacy education. Recent research points to a need for identifying early predictors of relevant graduate student outcomes, such as publications. The graduate student activity report is a collaborative, closed-looped process aligned with core institutional values that promotes decision making, institutional effectiveness, and accountability. Ongoing work includes process refinements, improved metric definitions, and additional data analyses. 1. Hall et al. PLoS One. 2017; in press.

**Identifying Patterns of Student Success Across Pharmaceutics Coursework in a New PharmD Curriculum.** Deborah L. Elder, *The University of Georgia*, Michael J. Fulford, *The University of Georgia*. **Objectives:** The purpose of this research was to analyze student performance across sequences of pharmaceutics courses and material in new PharmD curriculum and with admissions variables. **Method:** This study looked at correlations between student performance in pharmaceutics material across the P1 and P2 years. Correlations between admissions variables such as PCAT scores, prerequisite GPA,



and interview scores were analyzed. **Results:** Using Pearson Correlation Statistics, the research yielded the following results. Prerequisite science GPA correlated to performance in pharmaceutical calculations ( $p=.006$ ), pharmaceuticals ( $p=.000$ ), P1 compounding labs ( $p=.013$ ,  $p=.003$ ,  $p=.039$ ), and P2 compounding labs ( $p=.012$ ). PCAT Composite, Verbal, and Reading scores correlated to performance in P1 compounding labs ( $p=.024$ ,  $p=.000$ ,  $p=.011$ ). Analysis of performance in pharmaceuticals courses that served as prerequisites for subsequent courses found positive correlations between these courses. Performance in pharmaceutical calculations correlated to performance in both P1 compounding assessments, the P2 compounding exam, and Pharmaceuticals I ( $p=.004$ ,  $p=.000$ ,  $p=.000$ ,  $p=.000$ ). Performance in the non-sterile compounding in the P1 fall semester did not correlate to performance in aseptic compounding performance in the P1 spring semester. However, P1 non-sterile compounding did correlate to Pharmaceuticals I and P2 non-sterile compounding performance ( $p=.000$ ,  $p=.001$ ). **Implications:** Appropriate sequencing and alignment of pharmaceuticals courses is an important component of student success in a PharmD curriculum. Additionally, analysis of admissions variables and their relationship to performance in pharmaceuticals courses offers opportunities for schools to identify students who may struggle in pharmaceuticals and thus may need additional support early in their PharmD program.

**Improving Student's Learning Experience in Pharmaceutical and Pharmaceutical Compounding Course Via Online Games.** Uyen Le, Sullivan University, Tuan Tran, College of Information and Computer Technology. **Objectives:** To assess the effectiveness of online games on student's learning experience in the pharmaceuticals and compounding course. **Method:** We created two online games, Zondle and Purposegame, to help students in reviewing covered content. Each game covered basic concepts/fundamentals of different topics. Students can freely access to the games at any time with unlimited attempts. The game outcomes were assessed through students' grades and survey opinions. **Results:** In our study, we experimented two scenarios. First, in Exam 1, we included mainly questions categorized as recalling and simple analysis. Data showed that students' average score (87.88.1) was significantly higher than that of the previous year (without games) (85.0%8.7) ( $p=0.03$ ). Second, in Exam 2 and Final Exam, we included most of the questions in applying and analyzing with a few questions of recalling forms. We found that in such a setting, the performances are similar from with and without games. In our survey, 94% students responded to the survey stating that 99% played the games, and 90% found them enjoyable. Students said that both games helped them to clarify the concepts (67%), get familiar with the question styles (68%), and save time for the exam preparation (60%). Overall, 60% of responded students thought that both games were helpful for the course, and 94% expected to have similar games for other courses. **Implications:** Data from our online games indicated performance improvement in student's learning regarding recalling and simple analysis. We will further revise and redesign our games to enhance students' critical thinking and problem-based solving skills.

**Integration of Pharmaceuticals, Compounding and Drug Information Skills to Inform Dispensing and Patient Counseling Discussions.** Rachel M. Slaton, Samford University, John J. Arnold, Samford University, Cheryl Miller, Samford University. **Objectives:** Describe the design and implementation of a skills lab in the second professional year that vertically integrates pharmaceuticals knowledge, compounding and drug information skills from the didactic coursework of the first professional year to make patient care decisions that inform dispensing and patient counseling discussions. **Method:** Integrated

pharmacy application (IPA) is a weekly skills lab designed to vertically and horizontally integrate didactic and practical application of content. A patient case including 10 open-ended questions was provided to the students. Questions assessed students' ability to electronically locate valid medical and drug information; conduct drug-drug interaction checks; evaluate the severity of interactions; and make dispensing and counseling decisions. Student knowledge and perceptions following the activity were evaluated by a 10-question survey using a 5-point Likert scale and two open-ended questions. **Results:** Response rate was 97% ( $n=123$ ). A majority of students agreed that they now felt comfortable locating information (98%); performing drug-interactions checks (100%); identifying and evaluating the severity of drug interactions (93% and 92%, respectively); calculating, weighing and measuring ingredients for compounding (96%); and demonstrating proper compounding technique (93%). Areas for improvement included increased knowledge of select dosage forms, formula ingredients and utilization of secondary literature sources. Overall, a majority of students felt the exercise improved their practical knowledge of drug interactions (93%). **Implications:** Student feedback suggests that the skills lab has been successful at integrating didactic content with practical pharmacy application. This feedback will be helpful for further improving the activity and is valuable for documentation and assessment of curricular integration.

**Orientation, Boot Camps, and Pre-matriculation Programs in Schools of Pharmacy.** Eytan A. Klausner, South College, Karen S. Mark, South College, Beverly S. Hamilton, Lincoln Memorial University, Erica L. Rowe, South College. **Objectives:** To characterize orientation, boot camps, and pre-matriculation programs in schools of pharmacy. **Method:** An IRB approved survey was sent to Assistant/Associate Deans of Academic Affairs or administrators in similar positions in 130 schools of pharmacy. **Results:** Fifty one (39%) responses were obtained for the survey. Essentially all schools (98.04%) have an orientation program. Around 10% of programs have a boot camp, and another 10% of programs have a pre-matriculation program. Almost 12% of programs are considering the implementation of either a boot camp or a pre-matriculation program in the next few years. Forty percent of responders changed their program to better prepare student pharmacists to meet the 2016 ACPE standards, while 16% of responders plan to make changes in the next year. The most common components that appeared in these programs (in 80% - 88% of responses) were curriculum overview, experiential education overview, professionalism and integrity, review of academic standards, and introduction to professional organizations. Other less common components (in 60% - 72% of responses) included time management and organizational skills, team work, and interactions with faculty and student pharmacists. **Implications:** The diversity in students' educational backgrounds and experience may support the implementation of pre-matriculation programs and boot camps in additional schools of pharmacy. This research supports this perception. In addition, describing components of orientation, boot camps and pre-matriculation programs may provide insight to schools as they establish or modify such programs to better prepare students for the PharmD program and to meet the 2016 ACPE standards.

**Pharmacy Student Perception of Using an Approved Notecard Cheat-sheet on an Exam.** Erika Felix-Getzik, MCPHS University-Boston, Jonathan P. Valenzano, MCPHS University-Boston, Sabin G. Stephen, MCPHS University-Boston, David Schnee, MCPHS University-Boston. **Objectives:** To examine pharmacy students' perception of an approved notecard cheat-sheet before and after examination, in relation to utility, stress level, and time to complete the exam.

**Method:** PharmD students in their second professional year were surveyed before and after their final exam in a therapeutics course assessing perceived utilization, stress and anxiety level, and speed of completion during examination. The survey answer options were on a Likert scale. Notecards had to meet regulations and be approved by course instructors. **Results:** 289 (98.6%) of surveyed students created a notecard for the exam. Pre-exam, 91.7% (n=265) of students believed they would rely moderately to extensively on the notecard, while after the exam 80.1% (n=234) of students reported actually relying on it moderately to extensively. Leading up to the exam, 77.5% (n=224) believed the notecard would moderately to greatly decrease their stress and anxiety level. Notecard use during the exam resulted in a moderate to great decrease of stress and anxiety levels in 67.1% (n=194) of students. 20.1% (n=58) and 17.3% (n=50) of students, in the pre- and post-exam survey respectively, perceived that the notecard moderately to greatly decreases time spent to complete the exam. **Implications:** These findings suggest that the majority of students will create and use a pre-approved notecard cheat-sheet on an exam if allowed. The notecard may have beneficial effects on student perceived stress and anxiety level before and during the exam as well. Most students felt that the notecard did not decrease time to complete the exam.

**Redesign a Regulatory Science Course for both PharmD and Graduate Students.** Hai-An Zheng, *Albany College of Pharmacy and Health Sciences*, Thomas Garica, *Albany College of Pharmacy and Health Sciences*, Jenny Lin, *Albany College of Pharmacy and Health Sciences*, Yuzhu Teng, *Albany College of Pharmacy and Health Sciences*. **Objectives:** The drug development and approval process have been taught as a topic within pharmaceuticals, or as an independent elective. Regulatory Affairs has been an attractive career path for Pharmacy and Pharmaceutical Sciences students. In 2010, US FDA launched the Advancing Regulatory Science initiative, which have been strategically strengthening scientific research and industry. As an emerging area for research, practice and education, ACPHS have established a new course of Regulatory Science in 2012, and offered it again in 2016 spring with update and redesign, including new blended online components. **Method:** This 600-level course is designed as interdisciplinary learning experiences for graduate, PharmD, other professional students, and senior undergraduate, who are interested about a regulatory career. In 2016, classroom activities are blended with ten hours of eLearning lectures by industry leaders and online excises, to replace a field trip at the FDA given in 2012. Student's feedbacks through blog and assessments are routinely collected and analyzed in real time. At the end of semester, a focus group study with students are designed to collect and analyses students' feedbacks for education outcome study. **Results:** This reports our course design concepts, instructional design technology and education outcome for students': 1) learning effectiveness; 2) improvement on soft skills; 3) career motivation. **Implications:** When the definition and scope of Regulatory Science/Affairs for PharmD and Pharmaceutical Science curriculum is evolving, strategies to establish new course and eventually new programs on regulatory science should be further discussed within the academy.

**Rising From Ashes: Active Classroom Strategies for Learning Pharmaceutics Through Productive Failure.** Dan Cernusca, *North Dakota State University*, Sanku Mallik, *North Dakota State University*. **Objectives:** Learners often miss those problem solving steps and insights that address the conceptual integration of foundational knowledge in applicative instructional tasks exemplified in classroom through worked example. We implemented a productive failure active learning strategy to address this gap in problem solving process.

**Method:** The instructor worked with an instructional designer to implement productive failure strategy in Pharmacology I for the buffered and isotonic solutions section of the course. The core elements of this implementation were: (a) the exposure of students to difficult problems without any assistance; (b) a detailed discussion of the expected solution and its conceptual elements; and (c) a transfer problem, which students solved in an exam-like context. A quasi-experimental research design using one control and two treatment groups was implemented for this study. A perceptual exit survey was administered to the last treatment cohort. **Results:** A one-way ANOVA revealed a significant effect for the semester ( $p < .001$ ). Tukey's test showed that students in the 2016 cohort scored significantly higher on the buffering exam, than both 2015 cohort and the 2014 control cohort ( $p < .001$ ) used as the control group. A one-sample t-Test indicated that students perceived the productive failure activities as more valuable than lectures ( $p < .001$ ). **Implications:** The implementation of the productive failure strategy in the Pharmacology course confirmed its effectiveness when correctly transferred to pharmaceuticals education. More important, this strategy can be expanded to other pharmaceuticals and pharmacy practice courses with the goal of improving students' learning outcomes for challenging topics and problems.

**Status of Compounding Education in US Pharmacy Colleges and Schools.** Namita Giri, *West Coast University*, Mohammed A. Islam, *West Coast University*, Fred Farris, *West Coast University*, Reza Taheri, *West Coast University*. **Objectives:** To determine the current status of compounding education in US Pharmacy schools/Colleges. **Method:** A survey instrument was developed and distributed through survey monkey to the AACP Pharmaceutics/Pharmacy practice members of 136 PharmD programs. Survey items focused soliciting qualitative and quantitative information on delivery of compounding skills and faculty perceptions of compounding education. Descriptive statistics were used for data analysis. **Results:** One hundred one schools responded to the survey. Ninety schools reported to offer compounding course in their curriculum as stand-alone (34%), integrated (34%) and elective courses (32%). The average credit hours for required standalone courses and electives were 2.57 and 2.03, respectively. Seventy-two percent of the schools offer compounding course in the PY1 year. Teaching strategies in instruction of compounding include hands-on lab (100%), didactic lectures (85%), videos and animations (62%), projects (13%) and web-based learning (17%). Most common challenges identified by respondents were scheduling (60%), facility (labs/instruments) (66%), and financial constraints (54%). **Implications:** Faculties involved in compounding education must ensure adequate emphasis is given to the implementation of compounding in the curriculum. The significance of compounding course is underemphasized and lacks uniform structure or format. There is a need to develop and implement a uniform format of compounding content which can follow by US Pharmacy colleges and schools.

**Sterility and Stability of a Preservative-Free Albuterol Product.** Savannah Gully, *Norton Health Care*, Sarah Baltzley, *Sullivan University*, Tristan Murray, *Norton Health Care*, Janice Sullivan, *Norton Health Care*, Stephanie Simms, *Norton Health Care*, Adrian Hogan, *Norton Health Care*, Abeer M. Al-Ghananeem, *Sullivan University*. **Objectives:** To evaluate the sterility and stability of preservative-free (PF) albuterol compared to albuterol containing benzalkonium chloride (BAC), a common pharmaceutical preservative and potent bronchoconstrictor. Traditionally, hospitals used albuterol containing BAC for continuous nebulization; however, many have started using PF albuterol to avoid the bronchoconstricting effects of BAC. Unfortunately, no data exists for the long term stability and sterility of the PF

formulation. **Method:** Both albuterol formulations were diluted in normal saline to concentrations of 0.67 mg/mL and 0.17 mg/mL. Room temperature (RT) samples were incubated for ten days in aerobic and anaerobic blood culture media to assess for bacterial growth. Reversed phase high-performance liquid chromatography (HPLC) at a wavelength of 276 nm was used to test the stability of both formulations when stored at RT and refrigeration. Samples were tested hourly for 8 hours and daily for 72 hours. **Results:** No bacterial growth was observed from either formulation at day 10 of observation. The high concentration PF albuterol was stable at RT after 8 hours (concentration 0.629 mg/mL) and up to 72 hours (concentration 0.623 mg/mL). The low concentration PF albuterol resulted in a concentration of 0.157 mg/mL (8 hours) and 0.159 mg/mL (72 hours) at RT. Concentrations of albuterol with BAC were slightly higher, but demonstrated no differences in stability. There were no significant differences between storage at RT and refrigeration for any formulation. **Implications:** This study found PF albuterol to be similar in stability and sterility to albuterol containing BAC, allowing the PF formulation to be utilized for inpatient continuous nebulization.

**Student Learning Outcome Utilizing SimMan and Influence of Student Learning Preference (SLP) Style.** Afsana Momen, *Appalachian College of Pharmacy*, Craig R. Mullins, *Appalachian College of Pharmacy*. **Objectives:** 1) The effect of high fidelity SimMan based problem on student learning outcome, 2) The relationship between SLP style and attribution of learning acquisition (ALA) with the use of either written case or SimMan case in pharmacy education. **Method:** After approval from IRB, studies were conducted in P2 class in their 'Patient Assessment' course as follows, i) Assessment by MCQ, ii) Assessment of confidence using a confidence scale from 1-5, 1, not confident, 5, very confident, iii) Group assessment from video of SimMan case study. In i) to iii), all data were compared pre vs. post course. iv) Survey question about ALA either from SimMan or written cases, v) Evaluating relationship between SLP style e.g. Visual, Auditory, Reading/Writing or kinetic and % learning from SimMan or written cases. **Results:** Students (N= 59) demonstrated enhanced achievement (71 +/- .18% vs. 81 +/- .11%;  $p < .005$ ) and confidence level in patient assessment skills (3.57 +/- .36 vs. 4.01 +/- .22;  $p < .01$ ). Video analysis showed improvement in patient assessment skills. Eighteen out of 30 students report  $\geq 60\%$  of learning acquisition was attributed to SimMan case (60%). However, categorical X2 test shows no significant relationship between SLP and ALA from either SimMan or written case ( $p = NS$ ) **Implications:** Majority of students demonstrate enhanced achievement and confidence level with SimMan based learning. This enhanced learning activity, however, is not related to any SLP style.

**Team-Based Learning in Teaching of Biopharmaceutics.** Zoe Folchman-Wagner, *University of Southern California*, Rebecca M. Romero, *University of Southern California*, Dab A. Brill, *University of Southern California*, Ian S. Haworth, *University of Southern California*. **Objectives:** Results will be presented from a 2-year study of team-based learning (TBL) designed to evaluate transfer of information among students and examine the relationship of course outcomes with performance on individual (IRAT) and group (GRAT) readiness assessment tests. **Method:** TBL sessions were held to reinforce learning after lectures and take-home assignments. Each session included about 20 multiple-choice questions on drug solubility, absorption, transport and metabolism. Questions were answered individually without discussion (IRAT) and then after discussion in a group of 8 students (GRAT). Scheduling of TBL sessions varied with respect to timing of subsequent written examinations. **Results:** In four TBL

sessions, there was a correlation between the score for the best-performing student in a group and the average score for the group ( $R^2 = 0.48-0.65$ ), indicating strong information transfer within the group. This was reflected in questions being classifiable into three types: those mainly answered correctly in the IRAT, those for which the correct answer was mainly established in the GRAT, and those with many incorrect answers after the GRAT. The results of TBL sessions held within one week of an examination showed a weak relationship with examination outcomes ( $R^2 = 0.1$ ), whereas those held  $>4$  weeks before an examination showed no relationship with examination performance. **Implications:** Successful implementation of TBL and promotion of information transfer among students requires use of a balance of confidence-building simpler questions and more difficult questions that promote group discussion. An early-semester TBL session may provide an incentive for subsequent improvement of performance.

**Use of Interleaving to Enhance Student Learning and Knowledge Retention in a Blocked Curriculum.** Marcy Hernick, *Appalachian College of Pharmacy*. **Objectives:** To determine if interleaving can be used to enhance student learning and knowledge retention by pharmacy students in a modified blocked curriculum. **Method:** Daily active learning activities and online modules were developed for topics in Pharmacokinetics course over two consecutive years ( $n=70,65$ ). Assignments required students to answer questions covering both new and old material in a randomized order to create an interleaving effect. Group active learnings contained 4-10 questions with delayed feedback after grading. Online modules contained 15-40 questions each with multiple formats (e.g. multiple choice, numerical) and provided immediate feedback to students. Materials in year 2 were modified to address deficiencies identified in year 1 by building in more exposures over the course. A subset of questions from assignments were modified and included on formal assessments (i.e., 2 quizzes, 2 examinations). Ten of the topics were assessed on both examinations. **Results:** : Students in year 1 maintained/increased their performance on exam 2 vs. exam 1 for 6/10 topics with an average decrease of 15.1% points for remaining topics. Students had particular difficulty with three subtopics (drug interactions, metabolism, therapeutics) – mean final exam 49.3 – 56.2% (average decrease 20.4% points). Students in year 2 maintained/increased their performance on exam 2 for 8/10 topics with an average decrease of 3.5% points for remaining topics, while student performance on three targeted subtopics had mean final exam scores of 79.5 – 87.4% (average increase 17.9% points). **Implications:** Interleaving can be used in pharmacy education as a means to enhance student learning and promote knowledge retention.

## PHARMACY PRACTICE Completed Research

**A Health Humanities Course for Developing Interpersonal Skills in Pre-Professional Honor Students.** Therese I. Poirier, *Southern Illinois University Edwardsville*, Kate Newman, *Southern Illinois University Edwardsville*, Connie Stamper-Carr, *Southern Illinois University Edwardsville*. **Objectives:** To design and implement an undergraduate honors course for pre-health professional students that develops health perspectives and interpersonal skills through use of a variety of humanities. **Method:** A 3 credit hour course in an honors seminar sequence was developed by Pharmacy Practice faculty and with input from faculty in mass communications, philosophy, applied communication studies and history. The course utilized a variety of media such as literature, film, and podcasts to foster student discussion

and growth about a variety of health-related topics. Topics included public health, stigmatization, portrayals of health care providers, patient experiences, health care ethics, aging, and death and dying. Students were assessed using pre-class assignments and reflective writings as well as a formal written and oral presentation on a selected health-related book. A quasi-experimental design was used to assess the impact of the course on desired course outcomes. **Results:** The first course offering was to 22 undergraduate pre-health professional honors students. Pre and post-course surveys on students' perceptions and students' reflective writings revealed achievement of desired course outcomes. Post-course evaluations also revealed positive perceptions about the structure and benefits of the course. **Implications:** The course allowed students to think critically about various health care issues, and to begin to develop interpersonal skills while being exposed to a variety of humanities. The course could be adapted for the pharmacy professional program to help develop Standards 3 and 4 of the ACPE Accreditation standards.

**A Multi-State Survey to Determine the Need for a Pharmacist-Led Telehealth Opioid Abuse Prevention Program.** Kimberley J. Begley, *Creighton University*, Kathleen A. Packard, *Creighton University*, Amy Pick, *Creighton University*. **Objectives:** To conduct a needs assessment survey in elementary, middle, and high schools to determine if there is a need for a telehealth opioid abuse prevention and education program. **Method:** An electronic survey was sent to public and private school superintendents in nine states to assess the need for a pharmacist-led opioid abuse prevention and education program. Questions focused on school demographics, information on existing drug education programs, length and facilitator of current substance abuse programming, description of other abuse issues encountered, and if further prevention and education information was needed by the school. **Results:** Two-hundred-twenty-one respondents completed the survey. Forty-two percent of responding schools did not have any substance abuse prevention program. In schools with a program, Drug Abuse Resistance Education (D.A.R.E.) was the most commonly listed. Forty-seven percent of schools reported opioid abuse within their community. Fifty-three percent of schools reported a lack of opioid reversal agent awareness and fifty-two percent expressed interest in learning more about this. An unexpected result revealed schools are concerned with an array of other substance abuse issues and student engagement in risky behaviors. **Implications:** Our survey found that schools across the country have minimal or no exposure to opioid education programming. Data collected suggests that there is a wide variance among drug educational programs and a variety of personnel within the schools and communities teaching these programs. Development of a comprehensive and pharmacist-initiated telehealth opioid prevention and education program may help address current gaps by providing thorough and relevant drug information nationwide.

**A Pilot Study to Evaluate an Interprofessional Direct Patient Care Course Involving Pharmacy and Dental Students.** Elizabeth K. Pogge, *Midwestern University/Glendale*, Ron J. Hunt, *Midwestern University College of Dental Medicine/Arizona*, Lynn R. Patton, *Midwestern University/Glendale*, Steven C. Reynolds, *Midwestern University College of Dental Medicine/Arizona*, Tara D. Storjohann, *Midwestern University/Glendale*, Shawn E. Tennant, *Midwestern University/Glendale*. **Objectives:** The purpose of this study was to assess the effect of a dental clinical rotation program in which pharmacy students consulted with dental students who were providing oral health care to patients. **Method:** An interprofessional practice (IPP) course was offered as an elective to second-year pharmacy students

and required for third-year dental students. The course included two in-class sessions, one on-line lecture, and five clinic sessions. Program evaluation analyses included (1) a comparison of participating versus nonparticipating students on examinations testing knowledge of pharmacotherapy and IPP and (2) a descriptive analysis of IPP course evaluation results. **Results:** Among pharmacy students, but not dental students, mean scores were significantly higher for participants than nonparticipants on the 31-item pharmacy knowledge component of the exam (73.6% vs. 45.7%, respectively;  $p < 0.001$ ). On the eight-item IPP component of the exam, scores were significantly higher for participants than for nonparticipants, both among pharmacy students (67.9% vs. 45.7%;  $p < 0.001$ ) and among dental students (49.4% vs. 41.4%;  $p = 0.005$ ). Awareness and attitudes about IPP were generally high among course participants. **Implications:** An elective IPP course that integrates second-year pharmacy students with third-year dental students in the dental clinic may improve the pharmacy students' knowledge of pharmacotherapy in dental patients and improve the pharmacy and dental students' knowledge and attitudes about IPP.

**A Pre-Pharmacy Immersion Lab Designed to Engage Students and Heighten Professional Development.** Kimberley J. Begley, *Creighton University*, Kevin Fuji, *Creighton University*, Katie Neighbors, *Creighton University*. **Objectives:** To expose pre-pharmacy students to the importance of the pharmacy profession as it relates to patient care and, secondarily, to promote professional identity development in current Doctor of Pharmacy (Pharm.D.) students. **Method:** An immersion lab activity was developed to promote hands-on learning and spotlight pharmacist-provided patient care services (e.g. IV preparation, compounding, counseling on glucometer use, etc.). Pre-pharmacy students rotated through twenty hands-on stations, with Pharm.D. students serving as content experts at each station. A post-activity evaluation consisting of open-ended questions was administered to gain a better understanding of the value of the activity from both the pre-pharmacy student and Pharm.D. student perspective. **Results:** A total of 84 students participated (40 pre-pharmacy students and 44 Pharm.D. students). Twenty-seven pre-pharmacy students and 15 Pharm.D. students completed the post-activity evaluation. A thematic analysis was performed on the evaluation responses, and revealed the following themes: 1) pre-pharmacy students value interactive activities related to pharmacy practice; 2) pre-pharmacy students increased their knowledge of pharmacist duties and care responsibilities; 3) pre-pharmacy students found value in communicating with current Pharm.D. students; 4) Pharm.D. students understood the importance of representing their chosen profession; 5) Pharm.D. students improved their communication skills; and 6) Pharm.D. students realized the importance of serving as mentors and leaders within the profession. **Implications:** A hands-on pharmacy immersion lab integrating pre-pharmacy and Pharm.D. students is effective in promoting the pharmacy profession, helping pre-pharmacy students better understand the roles and responsibilities of a pharmacist, and stimulating the development of professional identity in Pharm.D. students.

**A Qualitative and Quantitative Assessment of a Newly-Implemented School-Wide Remotely Proctored Electronic Examination Policy.** Sarah L. Anderson, *University of Colorado*, Jennifer M. Trujillo, *University of Colorado*, Sheryl F. Vondracek, *University of Colorado*, Sarah N. Fischer, *University of Colorado*, Joseph J. Saseen, *University of Colorado*. **Objectives:** Identify P2 students' attitudes and beliefs regarding mandatory electronic exams with remote proctoring taken during a 39-hour testing window, describe exam performance, and determine test-taking behaviors. **Method:** Part 1: Students

enrolled in two simultaneous pharmacotherapy courses in the fall 2016 semester were invited to voluntarily participate in a web-based survey regarding their attitudes and beliefs about electronic exams with remote proctoring both pre- and post-semester. Part 2: Quantitative exam data and test-taking behaviors for the fall 2016 semester were extracted. **Results:** 74 (53.6%) and 42 (30.4%) students responded to the pre- and post-semester surveys, respectively. Students reported being more comfortable with electronic exams at the end of the semester than the beginning (35.1% pre- vs. 73.8% post-semester,  $p=0.0001$ ) and increased preference for electronic exams at the end of the semester (6.8% vs. 26.2%,  $p=0.0009$ ). The most frequently reported benefit of remotely proctored electronic exams was flexibility (77.4% vs. 87.0%,  $p=0.2461$ ). The most frequently reported concerns were technical issues (31.6% vs. 24.4%,  $p=0.4318$ ), adjusting to the new process (30.5% vs. 28.9%,  $p=1.0$ ), and cheating (29.5% vs. 22.2%,  $p=0.4205$ ). Mean exam scores were similar to the previous two years' scores. There was a trend toward higher scores for exams taken during the first half of the testing window. **Implications:** Incorporation of a new exam process identified multiple concerns from students. Even though students' comfort level with the new process improved by the end of the semester, only one-quarter of students preferred electronic exams with remote proctoring to traditional paper-based exams.

**A Simulation to Assess Students' Knowledge of Cardiac Arrest and Perceived Readiness for Interprofessional Learning.** Jeanne E. Frenzel, *North Dakota State University*, Margaret Mackowick, *North Dakota State University*, Gail Gores, *North Dakota State University*, Marsha Ramstad, *North Dakota State University*. **Objectives:** To develop a simulation to assess students' knowledge of adult cardiac arrest and perceived readiness for interprofessional learning and teamwork. **Method:** Faculty facilitated an adult cardiac arrest simulation using a human patient simulator. Seven pharmacy and nursing students were in each group. Groups met with faculty before and after the simulation to pre-brief and de-brief. The pre-briefing was used to review the cardiac arrest algorithm and to assign responsibilities. Pharmacy students were responsible for the defibrillator, medications, recording the code, and evaluating peers. Nursing students were responsible for compressions, ventilation, and medication administration. Students were observed by faculty via video. During the de-briefing, students watched their recorded video and faculty led a discussion about student performance. **Results:** A survey was used to measure student's knowledge of adult cardiac arrest, their Readiness for Interprofessional Learning (RIPLS), and their Team Skills (TSS). Fifty-two out of 83 (62.7%) pharmacy students and 37 out of 57 (64.9%) nursing students completed surveys. A paired t-test indicated a statistically significant increase of mean values for perceived knowledge from pre to post simulation ( $p<.001$ ) for: cardiac arrest, teamwork and collaboration, professional identity, roles and responsibilities and team skills. An independent sample t-test found no differences by gender or major. However, compared to pharmacy students, nursing students perceived a statistically significant higher ability to work on a team ( $p < 0.001$ ) prior to the simulation. **Implications:** A simulation increased student's knowledge about adult cardiac arrest and positively increased their perceptions of learning and working with other health profession students.

**A Team-Based Learning Method for Teaching Special Topics Resources in a Drug Information Course.** Laura M. Koppen, *University of Illinois at Chicago*, Samantha Spencer, *University of Illinois at Chicago*, Heather Ipema, *University of Illinois at Chicago*, Courtney Krueger, *University of Illinois at Chicago*. **Objectives:** To evaluate the

effect of team-based learning (TBL) on PharmD student satisfaction in a newly revised didactic drug information (DI) course at University of Illinois at Chicago (UIC) College of Pharmacy, and compare TBL with traditional lecture instruction in terms of student learning. **Method:** In the newly revised course, TBL individual readiness assurance test (iRAT) and team readiness assurance test (tRAT) scores were used to assess student learning. In the previous traditional lecture course, student learning was assessed using a sub-score of prior examination questions on special topics DI resources. Students in the revised course were also surveyed regarding their satisfaction with the TBL experience. **Results:** Baseline characteristics were similar between students in each course. The mean prior examination sub-score ( $n=191$  students) was 82.7% (SD 13.5%). The mean iRAT score ( $n=174$  students) was 68.2% (SD 15.8%) and the mean tRAT score was 89.7% (SD 5.6%,  $p<0.001$  for tRAT vs. iRAT and tRAT vs. sub-score). When surveyed on satisfaction, 77.1% of students agreed or strongly agreed that they gained on learning because of the TBL class format, and 73.5% of students agreed or strongly agreed that they were happy with the way the material was taught. Responses to questions on learning materials, in-class discussions, active engagement, and team dynamics were similarly positive. **Implications:** TBL may not improve individual student learning of special topics DI resource material; however, team learning improves overall scores and students found value in TBL. Additional experience with the TBL format may help maximize student learning.

**Administration, Billing and Payment for Pharmacy Student-Based Immunizations to Medicare Beneficiaries at Mobile Medicare Clinics.** Joseph A. Woelfel, *University of the Pacific*, Edward L. Rogan, *University of the Pacific*, Rajul A. Patel, *University of the Pacific*, Winnie Ho, *University of the Pacific*, Hong Nguyen, *University of the Pacific*, Emily Highsmith, *University of the Pacific*, Claire Chang, *University of the Pacific*, Nhat-Thanh Nguyen, *University of the Pacific*, Morgan Sato, *University of the Pacific*, Daniel Nguyen, *University of the Pacific*. **Objectives:** Introduction: Senior vaccination rates still remain below Healthy People 2020 targets. Pharmacy student-delivered immunizations during community health clinics can help improve these rates. The ability to bill and receive reimbursement allows for the provision of different types of vaccines while also ensuring the sustainability of such efforts. **Objectives:** 1. Improve senior vaccination rates 2. Implement, deliver, and demonstrate a novel, financially sustainable curricular-based immunization program by trained pharmacy students as part of their experiential learning. **Method:** Methods: Community health clinics targeting beneficiaries were conducted throughout Northern/Central California during Medicare's fall open enrollment periods for 2014 - 2016. APhA-trained student pharmacists (under licensed pharmacist supervision) provided Medicare beneficiaries with influenza, pneumococcal, Tdap, and shingles immunizations at point-of-care mobile clinics. Provided vaccines were billed via a secure HIPAA-compliant web-based portal. Verification of beneficiary eligibility and vaccine billing occurred simultaneously. Post-service reimbursement for Part B and D vaccines was received via Medicare electronic funds transfer. Data were collected under University-approved IRBs. **Results:** Results: Thirty-nine clinics were held from 2014-2016 during which 1,766 vaccinations (influenza, pneumococcal, Tdap, shingles) were administered to Medicare beneficiaries. In total, \$128,999 of revenue was generated for Part B/D billed vaccines that were provided. **Implications:** Implications: Pharmacy students are being trained to provide immunizations across the country and can utilize their skills to deliver public health impact-programs that are economically sustainable, thereby modeling the current and future role of pharmacy services and advanced pharmacy providers.

**An Acute Care Pharmacotherapy Elective Course as Preparation for Clerkship and Residency Training.** April Staton, *Auburn University*, Spencer H. Durham, *Auburn University*, Kurt A. Wargo, *Wingate University*. **Objectives:** Acute Care Pharmacotherapy (ACP) is an elective offered during the third professional year in order to prepare students for advanced pharmacy practice experiences (APPEs) in acute and critical care areas. The purpose of this study is to elucidate the relationship between participation in ACP and performance on APPE acute care inpatient rotations, and subsequent pursuit of residency training. **Method:** Students enrolled in ACP between 2010 and 2015 were included. Data used in the analysis included final letter grade in ACP, final letter grade on any inpatient, acute care APPE, and if the student completed post-graduate residency training. **Results:** A total of 144 students were included, ultimately completing 279 APPEs. Based on a ten-point rating scale, 102 earned an “A” in ACP, 40 earned a “B”, and 2 earned a “C”. Of the students who earned an “A” in the course, 86.8% earned an “A” on the APPE. Of the students who earned a “B” in the course, 63.4% earned an “A” in APPE. Students who earned an “A” in ACP were significantly more likely to earn an “A” on APPEs ( $p=0.028$ ) than those who did not. Sixty-six students (45.8%) went on to post-graduate residency training. Students who earned an “A” in ACP were significantly more likely to pursue residency than those who earned lower than an “A” ( $p=0.016$ ). **Implications:** Strong performance in the ACP course was associated with a high likelihood of performing well on APPE rotations. Further, almost half of the students who participated in ACP subsequently pursued residency training.

**An Examination of the Relationships Between PCOA and NAPLEX Subtopic and Total Scores.** Justine S. Gortney, *Wayne State University*, Michael J. Rudolph, *Marshall University*, Jaime L. Maerten-Rivera, *University at Buffalo, The State University of New York*, Brenda S. Bray, *Washington State University*, Sachin Shah, *Texas Tech University Health Sciences Center*, Shauna M. Buring, *University of Florida*, Elizabeth A. Coyle, *University of Houston*, Bradley E. Hein, *University of Cincinnati*. **Objectives:** To determine the strength of the relationships between the total and content area PCOA scores with the total and content area scores of the NAPLEX. **Method:** This study used matched data with a sample of 3 student cohorts (students graduating 2013, 2014 and 2015) from 6 different pharmacy schools/colleges. Protocol was approved as exempt by the Marshall University IRB. The sample consisted of students ( $N = 1,454$ ) that took the PCOA in P3 year and NAPLEX the following year. The total and each subtopic domain score of the PCOA was compared to the total and each competency area score of the NAPLEX exam. Pearson correlation coefficients were examined, for statistical significance and effect size, between the total and domain scores of the PCOA and the total and competency area score of the NAPLEX. **Results:** Each of the domain scores of the PCOA were significantly correlated ( $p < 0.01$ ) with each of the competency area scores of NAPLEX; the strength of these correlations ranged from  $r = 0.22$  to  $r = 0.45$ , indicating weak to moderate relationships. In addition, total PCOA score and total NAPLEX score were significantly correlated ( $r = 0.55$ ,  $p < 0.01$ ) with a fairly strong relationship. **Implications:** This study provides evidence that the PCOA and NAPLEX are correlated which suggests that the PCOA in combination with other potential predictors may be useful in identifying students that are at risk for failing the NAPLEX.

**An Integrated Curriculum and Pedagogical Outcomes: A Focus on Clinical Sciences.** Elaine Wong, *Long Island University*, Timothy V. Nguyen, *Long Island University*. **Objectives:** 1) To describe the implementation of an integrated curriculum between basic and clinical sciences. 2) To determine the current impact of an integrated curriculum on the learning of the clinical sciences. **Method:** An integrated

curriculum was designed to combine disciplines of pharmacology, medicinal chemistry and pharmacotherapy. The goal is to enhance student abilities to learn and apply the different sciences while using an organ-system approach beginning in the P2 year as apart of a nine-course sequence. Factors that influenced the new curricular approach include contact hours per course, lecture topic alignment, time allocation per topic and discipline, introduction of new technology (ExamSoft, Echo360), exploration of instructional strategies in and outside of class, coordination of assessment strategies, and the logistics of space and classroom availability. The following were compared between the traditional and new integrated curriculum: (1) student perceptions based on course evaluations; (2) student performance on pharmacotherapeutic topics based on exam item analysis and overall exam performance. **Results:** 1) Student course evaluations reflect similar outcomes based on a 15-item evaluation. Themes that emerged from student commentary include challenges and skepticism associated with the new pedagogical approach. 2) Student performances on the targeted and shared clinical sciences lecture topics were similar between the traditional and new curricular approach. **Implications:** Despite similar outcomes between the traditional and new curricular approach, there were preliminary concerns expressed by students regarding the depth and pace of the material delivered with the integrated course series.

**An Interactive Instructional Video to Improve Interprofessional Communication and Collaboration.** Tiffany Pon, *University of California, San Francisco*, Timothy Cutler, *University of California, San Francisco*, Josette Rivera, *University of California, San Francisco*, Rosalind De Lisser, *University of California, San Francisco*, Deborah Johnson, *University of California, San Francisco*. **Objectives:** Foster and improve interprofessional communication through simulation and video technology **Method:** A code blue simulation exercise was conducted with students from the UCSF Schools of Medicine, Nursing, Pharmacy, and Physical Therapy. Students performed the exercise four times and were debriefed on their “internal” thoughts on team interaction and barriers to communication. “Poor” and “Effective” versions of the simulation were video-recorded and edited. The “Poor” video was annotated with the students’ “internal” thoughts. Both videos were piloted in a didactic interprofessional communication small group activity. The impact of the small group exercise was assessed using the Interprofessional Attitudes Scale (IPAS). **Results:** Five students participated in the simulation and reported positive feedback on how the exercise improved their comfort with interprofessional communication. Fifteen students from Nursing and Pharmacy participated in the small group activity and completed a pre/post IPAS. There were significant increases in positive attitudes toward “Teamwork, Roles, and Responsibilities” and “Community-Centeredness.” More students “Strongly Agreed” with several IPAS statements after the activity, including the following: ●Shared learning experiences will help me - think positively about other health care professionals ( $p = 0.04$ ) - understand my own limitations ( $p = 0.02$ ) ●Accepting and embracing differences between team members and patients is essential for providing quality care ( $p = 0.04$ ) **Implications:** Both the simulation and small group activities performed well with students of different disciplines and prepared students to communicate effectively in an interprofessional environment. This supports the need for focused and active interprofessional education in communication.

**An Interprofessional Education (IPE) Activity to Promote the Importance of Oral Health in Overall Health.** Stephanie Conway, *MCPHS University-Worcester/Manchester*. **Objectives:** Increase PharmD students’ knowledge of oral health using an Interprofessional

Education (IPE) format with dental hygiene (DH) students. **Method:** Twenty-one PharmD students on their Advanced Pharmacy Practice Experiential rotation and 11 second year DH students participated in this activity. After students completed a brief test to assess baseline knowledge of oral health, they completed a module in the Smiles for Life online curriculum pertaining to the relationship of oral to systemic health. Students then participated in a live session during which they worked in interprofessional groups to analyze a patient case and answer related oral health questions first individually and then as a group while reviewing several over-the-counter oral health products. After completion of the activity, the students completed the same test taken before the activity to determine the impact of the activities on oral health knowledge. **Results:** The students scored higher on the test after completion of the oral health module and engaging in the IPE activity; scores on individual test questions improved by 6% to 41%. Further, when students worked together to discuss oral health cases, the responses were more comprehensive as compared to individual responses. **Implications:** Pharmacists are well suited to identify medication and health conditions that may affect oral health as well as make recommendations for oral health products. Dental hygienists are experts on oral hygiene and preventative care. An interprofessional education activity with DH and PharmD students is mutually beneficial in improving oral health knowledge and reiterating the relationship between oral health and overall health.

#### **An Interprofessional Education (IPE) Event, Involving Student Pharmacists, Designed to Reinforce and Apply Ethical Principles.**

Anna Nogid, *Long Island University*, Kathryn Kruse, *Long Island University*, Joseph P. Nathan, *Long Island University*, Jane Shtaynberg, *Long Island University*, Lisa Gordon-Handler, *Long Island University*, Bojana Beric, *Long Island University*. **Objectives:** To assess the impact of a large scale, live IPE event on student pharmacists' knowledge of bioethical principles and ethical position. **Method:** Student pharmacists in their third professional year were among the approximately 600 students from 10 different health profession programs who, in April 2016, participated in a live IPE event focusing on the IPEC competency domain of values and ethics. The event consisted of an introduction, small-group case-study discussions, and a large group debriefing. Students completed pre- and post-program evaluations assessing knowledge of bioethical principles, ethical position, and confidence in ability to manage ethical dilemmas as a member of interprofessional team. This report focuses on findings related to student pharmacists. **Results:** One-hundred ninety student pharmacists participated in the event. Students reported high levels of satisfaction with the IPE event, and reported increased confidence in their abilities as interprofessional team members. After participating in the event, students were better able to correctly identify bio-ethical principles,  $X^2(2, N=338, 22.327) p<.01$ , and more likely to "agree" that their professional program adequately exposed them to professional ethics,  $X^2(3, N=338, 21.889) p<.01$ , as compared to pre-participation. There was no statistical change in students' ethical position as measured by the "Ethics Position Questionnaire". **Implications:** A single-live IPE event may be effective in increasing student knowledge of bioethical principles, however may not lead to a change in ethical position.

#### **An Interprofessional Event to Improve Attitudes Towards Inter-professional Teams and Knowledge of Roles and Responsibilities.**

Anna Nogid, *Long Island University*, Kathryn Kruse, *Long Island University*, Joseph P. Nathan, *Long Island University*, Jane Shtaynberg, *Long Island University*, Lisa Gordon-Handler, *Long Island University*, Marion F. Masterson, *Long Island University*, Dominick Fortugno, *Long Island University*, Bojana Beric, *Long Island University*.

**Objectives:** To assess the impact of a large scale, live IPE event on student pharmacists' understanding of professional roles and responsibilities and on attitudes towards interprofessional teams. **Method:** In November 2016, approximately 600 students from 10 different health profession programs, including 190 student pharmacists in the second professional year, participated in a live IPE event focusing on the IPEC competency of roles and responsibilities (RR). The event consisted of an introduction, small-group case-study discussions, and a large group debriefing. Students completed, pre- and post-program surveys. This report focuses on findings related to student pharmacists. **Results:** The number of students who correctly identified the professionals integral to the healthcare team increased significantly from pre- to post-test,  $X^2(1, N=362, 48.722) p<.01$ . A significant increase was found in students' self-reported ability to define IPE,  $t(354)=6.318, p<.01$ , explain RR of pharmacists,  $t(356)=2.688, p<.01$ , explain RR of other professionals,  $t(355)=5.037, p<.01$ , explain similarities and differences in RR among various professionals,  $t(354)=4.61, p<.01$  and  $t(332)=6.705, p<.01$ , respectively, explain the need to collaborate with other health professionals  $t(355)=4.974, p<.01$ , and discuss the benefits of interprofessional collaborative practice,  $t(356)=4.192, p<.01$ . There was a significant change in students' attitudes towards interprofessional teams, as measured by the "Interprofessional Attitudes Scale (IPAS)",  $t(320)=2.014, p=.045$ . An examination of the subscales of the IPAS found a significant increase in positive attitudes related to Teamwork and Roles and Responsibilities  $t(320)=2.00, p=.046$ . **Implications:** A single live IPE event may be effective in increasing student understanding of and attitudes towards IPE.

#### **An Online Interprofessional Education Module for Motivational Interviewing.**

Michael J. Peeters, *The University of Toledo*, John M. Wrybeck, *The University of Toledo College of Medicine & Life Sciences*, Mary Kay Smith, *The University of Toledo College of Medicine & Life Sciences*. **Objectives:** Pilot an online interprofessional education (IPE) elective module to introduce students to motivational interviewing (MI). **Method:** A 4-week elective IPE module was developed. Week 1 was completion of BMJ Learning module on MI [<http://learning.bmj.com/learning/module-intro/.html?moduleId=10051582>]. Weeks 2-4 were case-based applications (medication non-adherence, smoking cessation, weight loss); as a MI expert, JW developed the cases. In interprofessional discussion groups, students discussed cases with PhD MI experts (using Blackboard discussion-thread); groups also had an IPE expert to meaningfully add an interprofessional dimension to discussions. Each case had 3-4 MI questions, and 1 IPE question focused on roles. Before and after this module, each student completed a Jefferson Scale of Empathy (HS-version). Students also completed an evaluation at module's end. **Results:** Thirty-eight health-professions students participated [pharmacy=19, nursing=1, medicine=17 and physician assistant=1]. Mean age was 23yo, and 66% (25/38) were female. Students were placed into four interprofessional teams of 9-10 students. With acceptable internal-consistency on Jefferson Scale of Empathy (Cronbach's alpha: pre=0.78, post=0.72), students' improved [pre=103(13), post=121(10); paired t-test  $p<0.001$ ; Cohen's  $d=1.5$ , VERY-LARGE]; inferential data were available for only 32 students. On students' module evaluations, the online format was noted as very helpful; students appreciated time to read/understand each case thoroughly, pause, and then thoughtfully respond. **Implications:** This module successfully introduced students to MI. The practical significance (effect-size) was impressive; despite first-time mishaps, like miscommunication among facilitators, students were overwhelming positive about this elective. This module's online format proved helpful in overcoming a scheduling

barrier for IPE; further MI instruction for these students should be face-to-face.

**Analysis of a Clinical Reasoning Course Designed to Evolve Students' Thinking and Learning Strategies.** Valerie D. Nolt, *University of Kentucky*, Jeff J. Cain, *University of Kentucky*, Daniel P. Wermeling, *University of Kentucky*. **Objectives:** To determine if a clinical reasoning course influenced student perceptions on evolution of their thinking and learning strategies and ways to improve. **Method:** Thematic analysis was used to examine first year student pharmacists' midpoint and final self-reflections on progression of their thinking skills as a result of the course. My Thinking Style and Course Objective Assessment surveys were used to provide additional course feedback. **Results:** Thematic analysis of midpoint student reflections (n=133) revealed 8 different themes of how students perceived evolution of their thinking. Top themes were approaching a problem (n=76), evaluating information (n=62), and efficiency (n=44). Thematic analysis of final student reflections (n=139) of their thinking and how they needed to improve revealed 5 themes related to involvement of thinking and learning strategies and 4 themes on improvements needed. Top three final themes related to involvement were thought process (n=89), considering the "big picture" (n=55), and efficiency (n=46); the top themes related to improvement were continue applying (n=74) and communication (n=23). From the My Thinking Style survey (n=138) a majority of students identified as analytical (n=42) or systematic (n=33) thinkers. A Course Objective Assessment survey (n=138) determined students rated each of ten course objectives as achieved at a frequency of 71.7-97.1%. **Implications:** A novel course designed to develop clinical reasoning skills can help students evolve their thinking and learning strategies and engage them in a process for the application of knowledge to patient care.

**Analysis of the Impact of Education on Understanding OTC Medication Labels in Children Ages 9-12.** Emma Schutt, *Ohio Northern University*, Mary Palmer, *Ohio Northern University*, Erin Petersen, *Ohio Northern University*. **Objectives:** As early as age 11, children become more autonomous and self-medicate. In 2012, poison control centers managed over 296,000 cases involving children ages 6 to 19 with half involving medication misuse. The goal of this study was to determine if a short educational intervention improves students understanding of proper Over the Counter (OTC) administration leading to safer medication use. **Method:** A 21 question survey, including true/false questions and a free response patient scenario, was used to assess 6th grade students' understanding of information related to OTC medications, dosing, and safety as well as demographic data. A pretest/posttest model with a 30 minute educational intervention was completed to gain and demonstrate student knowledge of OTC medications and safety. Pretest/posttest data were compared using Wilcoxon Signed Rank Test data via the SPSS system. **Results:** 66 students completed all required components of the activity. Overall, improvement in student performance was noted on 5 of 5 of the patient scenario related questions and 9 of 10 true/false questions. Statistically significant changes were noted for 7 of the 15 questions including significant improvements in understanding the function of poison control centers (p<0.01), the use of the Drug Facts label to determine symptoms to treat (p=0.01), and definition of an active drug (p=<0.01). **Implications:** A brief, 30 minute education session can improve young student understanding of OTC medications including the appropriate dosing and Drug Facts label usage.

**Assessing Advanced Pharmacy Practice Experience Preparedness From the Student and Preceptor Perspectives.** Elias B. Chahine, *Palm Beach Atlantic University*, Jean Rogers, *JFK Medical Center*, Jinhee Lee, *Palm Beach Atlantic University*, TJ Stimson, *Palm Beach*

*Atlantic University*, Jamie L. Fairclough, *Palm Beach Atlantic University*, Carlos Torrado, *Palm Beach Atlantic University*. **Objectives:** To assess student and preceptor perceptions of Advanced Pharmacy Practice Experience (APPE) preparedness. **Method:** A Likert scale survey was developed to assess students' and preceptors' perceptions of APPE preparedness and the extent of student preparedness in key areas of the didactic curriculum. Upon completion of their APPEs, the survey was distributed to all fourth-year pharmacy students and their preceptors. Data were analyzed with a series of Fisher's Exact Tests using SPSS statistical software v. 23. **Results:** A total of 78 students (100 percent) and 64 preceptors (28 percent) completed the survey. Students rated the following areas as the most important: communicating with patients, communicating with healthcare professionals, and identifying drug therapy problems. Students felt they were least prepared in the following areas: pediatrics, pharmaceuticals, and informatics. Preceptors rated the following areas as the most important: communicating with patients, identifying drug therapy problems, and pharmacology. Preceptors felt students were least prepared in the following areas: pediatrics, regulatory compliance, and oncology. There were significant differences between the student and preceptor perceptions regarding the levels of importance of modules related to pharmacy practice and pharmacy management (p<0.001). There were also significant differences between student and preceptor perceptions regarding student preparedness in modules related to drug information, pharmaceutical sciences, and pharmacotherapy (p<0.001). **Implications:** Students and preceptors agreed that students were least prepared in pediatrics, therefore, faculty should consider improving the delivery of pediatrics content in the didactic curriculum. Faculty should also consider incorporating the student and preceptor feedback more effectively into curricular changes.

**Assessing Course Structure Effectiveness With Teaching Evaluation Scores.** Robert P. Shrewsbury, *University of North Carolina at Chapel Hill*. **Objectives:** The required compounding course in the newly transformed curriculum was taught back-to-back to balance the PY1 course load. The initial offering was six-weeks of nonsterile compounding followed by six-weeks of sterile compounding instruction. In the second offering, the nonsterile and sterile portions of the course were alternated. This study investigates how the two course structures influenced the teaching evaluation scores. **Method:** Students completed the school-wide course evaluation survey at the end of each semester which contain nine rank items about the course (seven items) and the course instructor (two items). Of the nine items, six items addressed aspects that were kept constant in the two course structures. Three items were expected to vary due to changes in course structure: one course evaluation item, and two instructor evaluation items. **Results:** The one course item "The course was well organized" increased when the nonsterile and sterile portions were alternated (3.76 +/- 0.88 to 4.46 +/- 0.62; 5 maximum). The two instructor items increased with this new structure: effectiveness (3.94 +/- 1.00 to 4.80 +/- 0.61) and engagement (3.83 +/- 0.99 to 4.77 +/- 0.63). The overall course evaluation also rose from 3.71 +/- 0.31 to 4.40 +/- 0.21. **Implications:** The relationship between teaching scores and course structure may not be straight forward; however, in our study, there was a correlation between the relevant course evaluation item and the two instructor evaluation items. The study implies that if teaching evaluation scores are less than desired, then course structure may be an important factor to consider.

**Assessing Development in Interprofessional Education: a Quasi-Experimental Analysis of Reflective Writings.** Michael J. Peeters, *The University of Toledo*, Martha Sexton, *The University of Toledo College of Nursing*. **Objectives:** Evaluate IPE development with an



assessment-FOR-learning approach using reflective-writing  
**Method:** Students from eleven health-professions took a learning objective-based self-assessment before and after an IPE course in 2015 & 2016. The instrument asked students to self-rate their ability for course learning objectives (which were based on US Interprofessional Collaborative's Core Competencies). In 2016, PharmD and nursing students reflectively-wrote (intervention) near the beginning of an IPE course. For comparison, nursing and PharmD students' self-assessment data from 2016 was compared with 2015. Second, and as further control within this quasi-experimental design, medical students data was also compared between 2015 and 2016 (no reflective-writing in either 2015 or 2016). Analysis for statistical significance used t-tests, while practical significance used Cohen's d effect-size. Cohen's d interpretations were used to compare 2015 and 2016. **Results:** In 2016, 376 medicine, nursing and pharmacy students were internally-consistent (pre=0.95, post=0.98), and developed [pre=2.8(0.8), post=3.6(0.9);  $p < 0.001$ , Cohen's  $d = 1.0 = \text{LARGE}$ ]. In 2015, 387 medicine, nursing and pharmacy students were also internally-consistent (pre=0.96, post=0.93), and improved [pre=3.0(0.8), post=3.5(0.7);  $p < 0.001$ , Cohen's  $d = 0.6 = \text{MEDIUM}$ ]. Comparing effect-sizes, nursing students grew from medium to large, and pharmacy students grew from large to very large. Meanwhile, medical students remained with large effect-sizes for both 2015 and 2016. **Implications:** Herein, writing reflectively near the beginning of an IPE course appeared to enhance improvement in students' self-assessments of interprofessional collaboration. This formative, assessment-FOR-learning approach appears promising for use in nurturing IPE development (ie, Accreditation Council for Pharmacy Education's Standard 11).

#### **Assessing Pharmacy Student Confidence to Answer Patient Questions Regarding Herbal Medicines and Natural Product Drugs.**

Jennifer L. Babin, *The University of Utah*, Skye A. McKennon, *The University of Utah*, Marisa B. Schauerhamer, *The University of Utah*, Hannah R. Fudin, *The University of Utah*, Laura Shane-McWhorter, *The University of Utah*. **Objectives:** The primary objective of this study was to assess change in pharmacy student confidence relating to herbal medicines and natural product drugs (HMNPD) after completion of an HMNPD course. Additional objectives were to assess student opinion regarding HMNPD safety and efficacy and the appropriateness of course content. **Method:** A questionnaire was developed to assess student confidence in responding to patient questions, recommending medical condition specific products, and retrieving evidence-based resources regarding HMNPD. The questionnaire was administered to third year pharmacy students during the first and last week of a one semester HMNPD course. **Results:** Of 59 students enrolled in the HMNPD course, 55 students participated in the first week survey and 56 students participated in the last week survey. Students reported an increase in confidence when answering questions about HMNPD from the first week of the course compared to the last week ( $p < 0.001$ ). Their confidence in recommending products and their ability to find reliable resources about HMNPD also increased throughout the course ( $p < 0.001$  for both outcomes). Students' overall confidence in HMNPD safety and effectiveness did not significantly change during the course. Through the questionnaire, students also provided their opinion on the most useful topics taught in the course. **Implications:** This study demonstrated that an HMNPD course with various teaching strategies and activities successfully increased students' confidence in their ability to provide patient care related to HMNPD. The results of this study also provide suggestions for relevant topics that should be considered for inclusion in HMNPD courses.

#### **Assessing Self-Awareness and Professionalism in a Doctor of Pharmacy Curriculum.**

Lisa M. Cillessen, *University of Missouri-Kansas City*, Steven C. Stoner, *University of Missouri-Kansas City*. **Objectives:** With ACPE accreditation placing an increased emphasis on self-awareness (CAPE 4.1) and professionalism (CAPE 4.4) in doctor of pharmacy programs, the process of curricular mapping to these outcomes is critical. This project aimed to assess self-awareness and professionalism in the current curriculum and identify potential gaps. **Method:** The UMKC SOP Professionalism Committee (PC) created and distributed a survey to course coordinators to collect information on self-awareness and professionalism. They completed a self-assessment of their course and provided a summary of the content taught, including delivery and assessment methods and level of complexity. The PC then completed a curricular map showcasing where self-awareness and professionalism were taught in the curriculum and the skill level students were expected to reach by semester end. **Results:** Of 45 required courses in the UMKC SOP curriculum, course coordinators self-identified 15 courses addressing self-awareness and 23 courses addressing professionalism. Delivery methods was diverse and varied between lecture, large and small group discussion, videos, labs, and projects. Assessment methods varied and included exams, class participation, formative feedback, and written reflections. The committee was able to demonstrate topic coverage in each semester and identified where increased level of skill is desired. **Implications:** Completing the self-assessment survey allowed for the identification of potential gaps in students' self-awareness and professionalism education. Gathering the information also provided a starting point for assessing self-awareness and professionalism during course reviews in order to keep the information up-to-date, provide an outside view of the content, and identifying potential gaps.

#### **Assessing Student Performance in the Medication Use Process Using Community Pharmacy Simulation (MyDispense).**

Clark Kebodeaux, *University of Kentucky*, Keith Sewell, *Monash University*, Aric Schadler, *University of Kentucky*, Keenan Beaumont, *Monash University*. **Objectives:** MyDispense is a community pharmacy simulation designed to provide students opportunity to learn the medication use process. MyDispense was implemented in the Patient-centered Care Experience (PaCE) simulation sequence at the University of Kentucky College of Pharmacy during the P1 year as introduction and assessment for the medication use process within community pharmacy practice. This study aimed to assess factors impacting student performance in meeting competency for basic dispensing skills. **Method:** 139 students completed 9 practice exercises and an assessment consisting of 2 exercises. Students were able to repeat practice exercises as frequently as needed to prepare for the assessment. Aggregate, anonymous administrative data was assessed to identify frequency of practice exercises completed and total assessment time to identify high student performance. The study was designed to evaluate if time or practice opportunities predicted student success on assessments utilizing the MyDispense program. Analysis was conducted with SPSS (IBM Corporation, Armonk, NY, Version 23). **Results:** Overall assessment performance was high. 91.4% (127/139) of students met assessment competency with an average score of 92.7%. Total practice exercise completion was negatively correlated with student performance on the assessment ( $r = -0.255$ ,  $p < 0.002$ ). Total exam time was not significantly correlated with assessment performance ( $r = -0.093$ ,  $p = 0.273$ ). **Implications:** Total assessment time was not a significant predictor of student success using MyDispense. However, the significant negative correlation between practice exercise attempts and student performance may help identify students

at risk for not meeting competency in teaching the medication use process using MyDispense.

**Assessing Student Viewing Behaviors for Online Lectures and its Impact on Student Examination Performance.** Neha S. Pandit, *University of Maryland*, Shannon R. Tucker, *University of Maryland*. **Objectives:** Using a flipped-classroom model, students in Infectious Diseases Therapeutics (IDT) 1 and 2 view online lectures prior to attending workshops where they answer questions about patient cases to synthesize knowledge. The objectives of this study were to assess 1) the association between pre-workshop lecture viewing (pre-viewing) and examination scores and 2) change in student viewing behavior between IDT1 and IDT2. **Method:** This retrospective study included students who completed IDT1/2 in 2015-2016. For the primary objective, lecture viewing analytics was evaluated to compare each student's percent lectures viewed before respective workshops to their examination scores on the workshop topic(s). A Pearson correlation coefficient was used to assess this objective. For the secondary objective, the overall percent of lectures viewed in IDT1 and 2 was compared using the Wilcoxon signed-rank test. **Results:** In IDT1, 154 students were enrolled and 151 completed IDT2. Of the 7 workshops in IDT1 there was a moderate correlation between pre-viewing and examination scores in the endocarditis/osteomyelitis workshop ( $r=.33$ ;  $p<.000$ ). Four other workshops in IDT1 also showed a small positive correlation ( $r=0.192-0.286$ ;  $p<0.01$ ). In IDT2, 2 out of 7 workshops showed a small positive correlation between pre-viewing and examination scores ( $r=0.254-0.28$ ;  $p<0.05$ ). A significant decrease in pre-viewing over time was seen with the average pre-viewing before workshops in IDT1 and 2 being 44.6% and 37.2% respectively. **Implications:** A flipped-classroom model has been implemented throughout pharmacy curriculums. This study suggests that many students may not be presenting prepared for this type of teaching which may not consistently impact their performance on examinations.

**Assessing the Effectiveness of a Motivational Interviewing Module in First Year Pharmacy Students.** Sharon E. Connor, *University of Pittsburgh*, Amanda Colangelo, *University of Pittsburgh*, Ana Lupu, *UPMC*, Mark Valenti, *Allegheny Health Network*, Karen S. Pater, *University of Pittsburgh*. **Objectives:** Communication is a key element in education as defined by ACPE and CAPE. Motivational Interviewing (MI) is a patient-centered proven method of effective communication. There is little literature describing optimal models for teaching MI to pharmacy students. The primary objective of this study was to evaluate a model of engagement with standardized patients (SP) following lecture to determine if MI knowledge, confidence and attitude improves. A secondary objective was to evaluate MI skills. **Method:** Pharmacy students completed surveys assessing knowledge, confidence and attitudes regarding MI, administered at baseline (prior to lecture) and endpoint (post SP experience). Knowledge was assessed by response to cases which were validated for face and content validity by two MI experts. Confidence and attitudes were measured using a Likert Scale. MI skills were assessed using a modified Behavior Change Counseling Index (m-BECCI) tool completed by faculty and peers. **Results:** A total of 112 (baseline) and 108 (endpoint) students completed the survey, with 108 completing the SP experience. Knowledge improved from 40% to 58% from baseline to endpoint, baseline confidence was 3.33 with endpoint being 4.08. Attitudes towards MI changed from 4.22 to 4.36. Faculty and peers rated student skills during the SP encounter as 1.94 and 3.36 respectively using the m-BECCI. **Implications:** Knowledge of MI improved, confidence increased, while attitude was high throughout. Knowledge did not transfer to skills as faculty were more critical in their evaluation

of student skills than were peers. Results demonstrate a need for increased practice opportunities within our curriculum.

**Assessment and Survey of Student Pharmacists' Knowledge and Perceptions of an Interactive Pharmacology Simulation Session.** Chasity M. Shelton, *The University of Tennessee*, Trevor W. Sweatman, *The University of Tennessee*, Stephanie J. Phelps, *The University of Tennessee*. **Objectives:** We assessed first-year student pharmacists' abilities and confidence in solving medication problems by working in teams during a pharmacology simulation. Students' perceptions of the effectiveness of team-based learning compared to individual abilities were also examined. **Method:** Both Individual Readiness Assurance Tests (IRAT) and Team Readiness Assurance Tests (TRAT) were completed. Students observed video-recorded simulations of changes in the autonomic system following administration of various medications. A 5-point Likert scale was created to evaluate the expectations and quality of the students' experience before and after the simulation. Survey questions focused on the learning experience, confidence in self- and team-based learning, and overall gain from the simulation. **Results:** Survey responses were analyzed on 192/207 (92.8%) students. Overall, TRAT scores were better as compared to IRAT scores. Prior to the session and post-session, students were more confident in their ability to assess a medication's therapeutic effects in a team with a mean  $\pm$ SD (3.94  $\pm$ 0.80 and 3.67  $\pm$ 1.06), as compared to individual ability (2.61  $\pm$ 0.92 and 3.09  $\pm$ 1.00). More importantly, students reported an increase in confidence in their individual ability to assess a medication's therapeutic effects after participating in the session with a post-session mean  $\pm$ SD (3.09  $\pm$ 1.00), as compared to the pre-session score (2.61  $\pm$ 0.93). All p-values  $<0.05$ . **Implications:** Students performed better and perceived better performance in this simulation when working in a team. Simulation using a team-based learning format should be considered as a way to augment a student's learning of a medication's effects on heart rate and blood pressure.

**Assessment of Student Pharmacists' Knowledge and Perceptions Regarding Care of Transgender Patients.** Laura E. Knockel, *The University of Iowa*, Michelle L. Miller, *University of Iowa Hospitals and Clinics*, Jeffrey C. Reist, *The University of Iowa*, Michelle A. Fravel, *The University of Iowa*. **Objectives:** Our objective was to increase student pharmacists' understanding of issues surrounding care of transgender patients. **Method:** Second-year student pharmacists at the University of Iowa College of Pharmacy completed a voluntary pre-survey using Qualtrics® consisting of three questions involving therapeutic use of hormones and four questions (using a 5-point Likert scale) concerning their perceptions of caring for transgender patients and exposure in the curriculum. Student pharmacists then attended a one-hour active learning presentation covering the role of the pharmacist in the care of transgender patients. After the presentation, the students completed a post-survey with the same knowledge and perception questions along with three questions evaluating the activity itself. Data were analyzed using McNemar and paired sample t-tests. **Results:** Students' performance on therapeutic questions improved significantly for all three questions ( $p = < 0.001$ ) after the activity. The students' understanding of the role of the pharmacist in the care of transgender patients improved significantly ( $p = < 0.001$ ). Students also feel more comfortable caring for transgender patients (3.33 pre vs 3.9 post). The majority (84%) of students agree more than one exposure to issues regarding care of transgender patients is needed in the curriculum, and 100% of students felt learning about transgender care was a positive experience. **Implications:** Exposure to care of transgender patients successfully increased student pharmacists' knowledge and perceptions of this patient population. Colleges of

pharmacy may want to add more exposure to specific patient populations, such as transgender patients, to prepare students for real world practice.

**Assessment of Student Pharmacists' Perceptions and Performance on an Evidence-Based Practice OSCE Station.** Josephine Aranda, *Western University of Health Sciences*, Marie L. Davies, *Western University of Health Sciences*, Cynthia Jackevicius, *Western University of Health Sciences*. **Objectives:** Assess students' attitudes and performance on an evidence-based practice (EBP) objective structured clinical examination (OSCE). **Method:** P2 students who participated in an OSCE assessing add-on heart failure therapy using EBP skills were included. This station consisted of a provider's drug-information question, researching background questions to call the provider to acquire specific patient information to develop a foreground clinical question, reviewing pre-appraised trial summaries, and applying evidence to write a recommendation. Pharmacy faculty acted as providers and assessed students on knowledge/analytical checklist (AC) and global communication (GC). Students completed a worksheet (WS) including developing a patient, intervention, comparison, outcome (PICO) statement, trial selection, number-needed-to-treat calculation, and a clinical recommendation. After, students were surveyed regarding perceptions of performance and OSCE applicability. **Results:** Students (n=129) felt applying literature to the case and WS development were most challenging. A majority of students felt this OSCE increased comfort in engaging with providers (73.6%) and that these skills transfer to real clinical scenarios (76.7%). AC, WS, and GC performance (mean %(SD)) were 72.4(22.5), 78.9(19.6), and 83.5(14.4), respectively. There were no significant correlations of overall clinical confidence with AC/WS scores, but confidence specific to obtaining information to develop a clinical question significantly correlated with AC performance (P=0.03). Additionally, students rating greater confidence with communication trended toward higher GC scores (P=0.07). **Implications:** Studies have examined EBP OSCE in medical training, but data are lacking in pharmacy trainees. Students perceived this OSCE helpful in engaging with providers. Revisiting application of literature and clinical recommendation development in the curriculum may be beneficial.

**Assessment of Supplemental Infectious Diseases Instruction Through Social Media.** Elias B. Chahine, *Palm Beach Atlantic University*, Timothy P Gauthier, *Charlie Rose, LLC*, Aisha Shokoya, *Palm Beach Atlantic University*, Keaton Grant, *Palm Beach Atlantic University*, Jamie L. Fairclough, *Palm Beach Atlantic University*. **Objectives:** To assess students' perceptions of supplemental infectious diseases instruction through social media. **Method:** An infectious diseases pharmacist posted content to active existing Facebook, Twitter and Instagram accounts, by the name of IDstewardship, for an entire semester. Posted content was composed and posted to correspond with topics from the course syllabus. Third-year pharmacy students enrolled in the infectious diseases pharmacotherapy course were informed of the activity and invited to follow at their own discretion. A survey to assess students' perceptions of supplemental infectious diseases instruction through social media was distributed at the beginning and end of the semester. Data were analyzed using descriptive statistics and the Chi-Square test. **Results:** A total of 72 students (95 percent) completed the pre-survey and 50 students (66 percent) completed the post-survey. Initially, 39 percent of students were following IDstewardship, which increased to 82 percent by the end of the semester. Fifty-three percent of students used IDstewardship to review content before exams. Students agreed that the content posted on social media enhanced their learning and changed their opinion on the value

of social media for educational purposes (p<0.001). The majority of students (73 percent) were more likely to follow pharmacy related educational social media outlets. Overall, students agreed that IDstewardship was valuable towards enhancing their education, with a majority of students (68%) intending to continue to follow IDstewardship on Facebook where most students were found to be engaged. **Implications:** Results from this research support the use of social media to supplement infectious diseases pharmacotherapy instruction.

**Assessment of Variables Affecting Performance on a Basic Pharmacy Knowledge Exam.** Sarah E. Griffin, *Harding University*, Lana Gettman, *Harding University*, Forrest L. Smith, *Harding University*, Susan M. Grace, *Harding University*. **Objectives:** To assess the correlation between student performance on a Basic Pharmacy Knowledge Exam (BPKE), cumulative grade point average (GPA), and Nelson-Denny Reading Test (NDRT) scores upon admission. **Method:** The faculty developed a multiple choice, non-case based exam. Two versions were created: BPKE-1, containing topics from previous pharmacotherapy courses (cardiology, dyslipidemia, venous thromboembolism, asthma, diabetes, infectious disease, and biostatistics) and BPKE-2 which included an additional 25 questions on central nervous system (CNS) covered during the Spring semester. The exams were given to third-year students at the beginning (BPKE-1) and the end (BPKE-2) of the Spring semester in 2015 and 2016. Step-wise regression analysis was conducted to identify the correlation between performance on these exams (BPKE-1, BPKE-2 (with and without CNS material)), cumulative GPA and NDRT scores (total and sub-components: vocabulary (NDRTVoc), comprehension (NDRTCom), and reading rate (NDRTRR)). **Results:** Regression analysis (n=118) indicated that GPA was a significant predictor of performance on BPKEs (R = 0.644 (BPKE-1), 0.556 (BPKE-2 without CNS), 0.478 (BPKE-2 CNS only)). NDRTVoc scores were a significant predictor of performance on BPKE-1 (R = 0.251) and the CNS section of BPKE-2 (R = 0.285). BPKE-2 scores without CNS material did not correlate to NDRTVoc scores (R = 0.066). **Implications:** Results indicate that cumulative GPA and NDRTVoc scores are predictive of performance on initial exposure to BPKE questions. This indicates vocabulary skills are important for student performance in the program. NDRT could also be a valuable screening tool for admission.

**Assessment of the Benefits Gained by Engaging Standardized Patients in the Active Learning Environment.** Brittany L. Riley, *Marshall University*, H. Glenn Anderson, *Marshall University*, Stephanie Anderson, *Marshall University Affiliated Residencies*, Christopher J. Booth, *Marshall University*, Ashley Brown, *Marshall University*, Christopher Gillette, *Marshall University*, Angel Kimble, *Marshall University Affiliated Residencies*, Nicole R. Winston, *Marshall University*. **Objectives:** The purpose of this study is to determine the benefit of routine use of standardized patients within a skills development course upon student acquisition of skill competency. **Method:** Students in the Professional Year 2 Patient Care Skills Laboratory course were divided into two groups. The control group performed activities utilizing role playing with peers in the course. The experimental group performed activities utilizing standardized patients. The course content, student learning outcomes, assessment and classroom attendance were equivalent for both groups. Students were assigned to groups based on simple randomization. The primary outcome was grades on the mid-term and final practical exams. These grades were assigned by the standardized patients used during the assessments. As a secondary outcome, faculty reviewers who were blinded to the group assignment reviewed the practical assessment and grades were compared. The Wilcoxon-Mann-Whitney test was used to examine the

association between exposure to a standardized patient and the dependent variables. The statistician was blinded to group assignment. **Results:** The students who were exposed to standardized patients did have slightly higher scores on the midterm practical (94.35 vs. 93.68), and the final practical (96.31, vs. 95.97). There were no significant differences between exposure to standardized patients and not being exposed to standardized patients on the midterm practical ( $z=0.58$ ,  $p=0.56$ ), and the final practical ( $z=-0.01$ ,  $p=0.99$ ). **Implications:** Utilization of standardized patients may positively impact acquisition of skill competency, however, further studies are needed to confirm this impact.

**Barriers to and Factors Influencing the Pursuit of Pharmacy Student Research.** Kathleen Vest, *Midwestern University/Downers Grove*, Milena McLaughlin, *Midwestern University/Downers Grove*, Keri DePatis, *Midwestern University/Downers Grove*, Tran Tran, *Midwestern University/Downers Grove*, Denise M. Kolanczyk, *Midwestern University/Downers Grove*, Ana C. Quinones-Boex, *Midwestern University/Downers Grove*, Justin Schmidt, *Midwestern University/Downers Grove*, Mary Ann Kliethermes, *Midwestern University/Downers Grove*, Arti Phatak, *Midwestern University/Downers Grove*.

**Objectives:** To identify the barriers students encounter and factors that influence students to pursue research during pharmacy school.

**Method:** A voluntary paper or electronic questionnaire was distributed to all pharmacy students at a private pharmacy school in mandatory courses during the 2016-17 academic year. The survey questions collected information regarding barriers encountered to pursuing research, potential factors that influence pursuit of research opportunities, and demographic information. Participation was incentivized with gift cards. This study was approved by the university's Institutional Review Board. **Results:** A response rate of 79% ( $n=623$ ) was achieved. The average respondent was female (69.1%), 25-years-old (IQR 23-26 years), employed (69.9%), and had a prior degree (66.6%). During pharmacy school, 27.3% of respondents pursued a research project. Of students not pursuing a research project during pharmacy school, the amount of interest to complete a project differed significantly between professional years ( $p<0.01$ ) with the second year class having the highest interest. Lack of time (91.3%), unfamiliarity with the research process (81.8%), and too much coursework (80.5%) were cited as the top three perceived barriers that have prevented students from pursuing research. A mandatory research class (87.6%), presentations describing faculty research interests (83.4%), and ability to work with a friend (83.9%) would most strongly influence students to complete research. **Implications:** Students report additional information regarding research opportunities would positively influence their decision to pursue research while in pharmacy school. Future studies should evaluate strategies used to familiarize students with the research process.

**Blood Pressure IDEAS Program: Utilizing Pharmacists in a Community Clinic to Improve Blood Pressure.** Hannah R. Fudin, *The University of Utah*, Skye A. McKennon, *The University of Utah*.

**Objectives:** The objective of the study was to determine the impact of pharmacist care on blood pressure (BP) control in patients with hypertension. **Method:** The primary outcome was achievement of BP goal and secondary outcomes included achieving systolic blood pressure (SBP) and diastolic blood pressure (DBP) goal. Patients 18-75 years old, with a primary care provider (PCP) at the University of Utah's Westridge Health Center, taking anti-hypertensive medication(s) or current hypertension diagnosis or SBP and/or DBP greater or equal to 140 mmHg, 90 mmHg, respectively were identified. The pharmacy team obtained hypertension management collaborative drug therapy

agreement referrals from patients' PCP. Pharmacists provided hypertension education, self-monitoring blood pressure (SMBP) instruction and monitoring devices, adherence assessment, and drug therapy optimization. Patients continued follow-up appointments and underwent therapeutic lifestyle education. BP goal achievement was analyzed using a McNemar test. Medication adherence was assessed from baseline to last visit. **Results:** 137 patients participated in the study. Patients had both SBP and DBP at goal at baseline ( $n=77$ ) and last visit ( $n=94$ ) indicating a statistically significant difference ( $p=0.0085$ ). At baseline SBP at goal included 84 patients and at last visit, 98 patients ( $P=0.0398$ ). At baseline DBP at goal included 111 patients and at last visit 118 ( $p=0.1904$ ). Medication adherence was reported at 86.4% at baseline and 92.6% at last visit. **Implications:** This study demonstrated pharmacist education, SMBP instruction, and drug therapy optimization improves BP goal attainment. Intensive lifestyle modifications and SMBP were the interventions most practiced and may have had the greatest contribution to goal attainment.

**Changes in Cultural Competence From a Standardized Patient Activity in the PharmD Curriculum.** Lauren J. Jonkman, *University of Pittsburgh*, Sarah Chaisson, *Memorial University of Newfoundland*, Janine Kendall, *Memorial University of Newfoundland*, Amna Jamil, *University of Pittsburgh/UPMC*.

**Objectives:** Cultural competence is an essential component of any PharmD program. The purpose of this study was to identify change in cultural competence among third year students after participating in a standardized patient (SP) activity. One patient had diabetes and wanted to fast for Ramadan and the second was a transgender patient who spoke about LGBT health needs.

**Method:** Students completed the Cultural Competence Assessment before and after the activity. Questions assessing cultural competence were rated using a Likert scale. Paired t-test were used to compare pre and post activity answers to determine p values and 95% confidence intervals. **Results:** 107 and 75 students completed the pre and post survey, respectively. 72 students had data that could be matched. The majority were Caucasian (70%) and female (70%). The average age was 23 years old. Students reported previous experience with an average of 4 racial/ethnic groups in the past 12 months (range of 1-7) and an average of 4 special population groups in the past 12 months (range of 0-7). After participating in the SP activity, students had an improvement in their overall self-reported cultural competence ( $p<0.05$ ). In addition, the Cultural Awareness and Sensitivity Subscale also improved ( $p<0.01$ ). **Implications:** By participating in cultural competence activities students became more confident working with other cultures different than their own. They also learned aspects of culture that can affect a person's health care needs. Overall students enjoyed participating in this activity and found it valuable to learn about sensitive topics.

**Changes in Student Self-Awareness of Performance on a Knowledge-Based Assessment.** Anne Kugler, *Western University of Health Sciences*, Marie L. Davies, *Western University of Health Sciences*, Eunice P. Chung, *Western University of Health Sciences*, Linda S. Garavalia, *Western University of Health Sciences*.

**Objectives:** Self-awareness of knowledge, skills, and abilities is an important trait of a professional. In this study, student pharmacists' self-awareness of knowledge was assessed over two consecutive years in the program to explore growth over time. **Method:** PharmD students completed comprehensive knowledge assessments (CKA) covering therapeutics topics twice in the second and once in the third year of a 4-year program. Students were asked to pre- and post-dict CKA performance for each administration. These pre/postdictions were then compared and correlated with actual CKA grades to measure accuracy of students'

self-awareness of knowledge level. Differences in accuracy over time were assessed using a repeated measures analysis of variance. **Results:** Of 115 students, mean postdictions were better than predictions, and postdictions significantly correlated with actual performance for all 3 exams ( $P=0.02$ ,  $P=0.005$ ,  $P=0.006$  respectively). Over time, mean differences between predictions and actual grades on the three exams increased from 8.43(16.29) to 14.03(17.18) to 16.72(15.48). A similar trend occurred for postdictions. Majority of students were under-predictors (<5% of actual score) on both pre- and postdictions for each exam. Additionally, the proportion of under-predictors increased over time. **Implications:** A possible explanation for the result could be decline in confidence due to increase in content amount and complexity tested over time. Inaccurate self-assessment could result in ineffective study strategies or time management, with under-predictors spending excessive time and over-predictors spending too little time in exam preparation. Future research should explore attitudes towards predictions to understand students' under-estimation and the relationship between students' perceptions and performance.

**Changes in Students' Perceptions Regarding Weight Throughout Pharmacy School: A 3 Year Single Site Study.** Kristen A. Pate, *The University of Louisiana at Monroe*, Adam Pate, *The University of Louisiana at Monroe*, Laurel A. Sampognaro, *The University of Louisiana at Monroe*, Kelsey Dearman, *The University of Louisiana at Monroe*, Stephanie Barre, *The University of Louisiana at Monroe*. **Objectives:** To evaluate the change in pharmacy students' perception of, intentions regarding, and actual weight throughout the didactic curriculum. **Method:** Consenting class of 2016 students completed an IRB approved survey during the fall semester of their first (P1), second (P2), and third (P3) professional years. Students subjectively classified their current weight (underweight, overweight, obese), described their intentions regarding weight (maintain, lose, or gain weight), and designated their current weight and overall health status (poor, intermediate, ideal). In addition, actual weight (measured using InBody 270 Body Composition Analyzer) and height were recorded. Statistical results were analyzed using GraphPad Prism 6® repeated measures analysis of variance. **Results:** Fifty-eight of seventy-three students (79%) completed all survey components for all years. There was a statistically significant change ( $p=0.03$ ) in accurate subjective classification of current weight. The majority of P1s in each BMI classification perceived their current weight as "normal". Corresponding P2 and P3 perceptions more accurately aligned with true BMI classification. Half of underweight students in P1 year wanted to lose weight, compared to P2 and P3 years where they reported wanting to gain weight, but overall intentions regarding weight and actual BMI did not change significantly throughout all three years ( $p>0.05$ ). **Implications:** Pharmacy school curricular and co-curricular activities may play a role in shaping students' personal perceptions and intentions regarding weight. This is an opportunity for schools of pharmacy to be more intentional in addressing this to allow students greater ability to impact weight and health management for patients.

**Changing Faces of Pharmacy Program: A High School Student Enrichment Program (CFPP).** Manouchkath Cassagnol, *St. John's University*, Vibhuti Arya, *St. John's University*, John M. Conry, *St. John's University*. **Objectives:** To provide underrepresented minority (URM) high school students with information on becoming college-ready, enhance their knowledge of the pharmacy profession and provide them with a longitudinal mentoring opportunity with a Doctor of Pharmacy (Pharm.D.) student. **Method:** The CFPP is a longitudinal enrichment and mentoring program, provided by Pharm.D. students for URM high school students. The CFPP program consists of live

informational sessions, on-campus workshops and activities, and an off-campus service activity, to expose the high school student to various aspects of the pharmacy profession and provide insights into the on-campus college experience. After completion of the program, students receive an anonymous and voluntary survey to assess program. We report below the results from the 2016-2017 program cohort. **Results:** Forty-four participants were enrolled. Seventy percent were juniors or seniors in high school with a majority representing URM group (30% Asian, 30% Hispanic, 20% non-Hispanic Black, 10% non-Hispanic White, 10% undefined or two or more races). Ninety-four percent of participants reported that their knowledge of the pharmacy profession increased, and 90% reported that the CFPP helped improve their understanding of the educational requirements to be a pharmacist and becoming college-ready. Ninety percent reported that their Pharm.D. student mentor was friendly, approachable, and capable in addressing questions related to the pharmacy program and profession. **Implications:** The CFPP and its mentoring component had an overall positive impact on exposing URM students to the pharmacy profession.

**Changing Students' Perceptions of the Pharmacist's Role in Transitional Care Using "Real World" Modeling.** Laura E. Knockel, *The University of Iowa*, Diane Reist, *University of Iowa Hospitals and Clinics*, Jeffrey C. Reist, *The University of Iowa*, Michelle A. Fravel, *The University of Iowa*. **Objectives:** To implement a series of three learning activities designed to expose student pharmacists to the various roles of pharmacists in improving patient outcomes during transitions of care and to assess student pharmacists' perceptions of the effectiveness of the learning activities. **Method:** Third-year student pharmacists at the University of Iowa College of Pharmacy completed three activities involving different points of transition. Teaching scenarios were based on both successful and unsuccessful real life transitional care experiences. A voluntary 6-item survey using a 5-point Likert scale was administered after the activities. The survey evaluated student perceptions before and after the activity using three areas involving transitions of care: the role of the pharmacist, terms and definitions used, and coverage in the curriculum. Data were analyzed using a paired sample t-test. This research study was considered exempt by the University of Iowa IRB. **Results:** Mean scores improved significantly ( $p < 0.0001$ ) for survey items in all three areas. The impact on student pharmacists' perception of the importance of their role in improving patient outcomes during transitions of care improved from a mean score of 3.97 to 4.72 (pre vs. post). Regarding students' perception of adequate exposure to transitions of care in the curriculum, the mean score improved from 3.18 to 4.28 (pre vs. post). **Implications:** The transitional care activities provided student pharmacists exposure to real life successes and failures in patient transitions. Adding this series of activities to the curriculum enhanced students' understanding of the role of the pharmacist in transitions of care.

**Clinical Impact of a Novel Interprofessional Dental and Pharmacy Student Tobacco Cessation Education Program.** Jacqueline M. Theodorou, *Temple University*, Matthew Boyd, *Temple University*, Jillian Lykon, *Temple University*, Shannon Myers Virture, *Temple University Kornberg School of Dentistry*, Melissa E. Rotz, *Temple University*, Elizabeth Waldron, *Temple University Kornberg School of Dentistry*. **Objectives:** To compare interprofessional care tobacco cessation education versus standard care tobacco cessation education in dental patients. **Method:** We implemented an interprofessional practice experience for dental and pharmacy students at Temple University's Dental Admissions Clinic. Dental patients received tobacco cessation education from interprofessional care teams. Surveys were

administered to assess outcomes. **Results:** All patients completed a survey that assessed perceptions of knowledge gained regarding tobacco cessation, barriers to quitting, intentions to set a quit date and to use pharmacologic tobacco cessation agents. Additionally, perceptions of the interprofessional care were measured. Fifty patients were enrolled [IPE (n=25), SC (n=25)]. IPE patients reported more knowledge gained immediately post-appointment and at four-week follow-up (median composite score 28 versus 13, respectively;  $p < 0.001$  and 30 versus 25;  $p = .009$ ); Although there was not a statistically significant difference in the number of quit attempts at the four-week follow-up, IPE patients that attempted to quit reported a higher incidence of setting a quit date (63.6%) compared to SC patients (20%) ( $\chi^2 = 4.07$ ,  $p = .044$ ) and contacting a provider for further assistance with quitting (81.8%) compared to SC patients (40%) ( $\chi^2 = 3.88$ ,  $p = .049$ ). The majority of IPE patients (82.6%) were extremely satisfied with their tobacco cessation education. **Implications:** These findings suggest that a novel interprofessional program between dental and pharmacy students may enhance patient outcomes in the area of tobacco cessation.

**College-Wide Efforts to Enhance Student Perceptions and Understanding of the Pharmacy Curriculum Outcomes Assessment (PCOA).** Tamara Goldberg, *Long Island University*, Tina Zerilli, *Long Island University*, Troy Kish, *Long Island University*. **Objectives:** LIU Pharmacy administered the PCOA to P3-students for the last 8 years. The extent to which students' understood the nature and purpose of the exam, and their level of effort and preparation was unknown. We sought to determine students' overall knowledge of and preparedness for the PCOA and the impact of college-wide efforts to inform and motivate students. **Method:** Following the Jan-2016 PCOA administration, P3 students (n=161) completed a 26-item survey designed to gauge students' knowledge of, preparation for, and effort in taking the PCOA. Subsequently, the College implemented several initiatives for the following P3-class including informational sessions, the ability to take the exam in P2 as a formative assessment, a guide to study resources, incentives for top scorers, and remediation for low performers. The survey was re-administered to the subsequent P3 class (n=211) following the PCOA administration in November 2016. Survey responses pre- and post- college efforts were compared using SPSS. The project received IRB exemption. **Results:** A significant increase in students' awareness regarding the exam purpose, blueprint, format, and registration process ( $p < 0.01$ ) was identified. A greater number of students felt that the College provided adequate information regarding exam preparation ( $p < 0.01$ ). Additionally, we noticed a significant increase in student's efforts the second time taking the PCOA ( $p < 0.01$ ). **Implications:** College initiatives were effective in increasing students' knowledge of, and preparedness and motivation for the now mandated PCOA. Efforts can now be focused on curricular revision to improve student performance.

**Comparing Acute Otitis Media Relapse Rates in Patients Receiving Guideline Driven or Non-Guideline Driven Therapies.** MaRanda S. Herring, *Harding University*, Kelly B. Walls, *Harding University*. **Objectives:** The purpose of this quality improvement project was to review the antibiotic prescribing practices for acute otitis media (AOM) at four patient centered medical home (PCMH) clinics and to compare relapse rates between patients receiving guideline driven therapies and non-guideline driven therapies. **Method:** This project was granted an IRB exemption before data collection could begin. A list of all pediatric Medicaid patients (n=531) having at least one episode of AOM in a period of 12 months was provided by participating clinics. Using a random number generator, 221 patients were

selected for inclusion in the study. A retrospective chart review was conducted for each patient. Data was analyzed using a 2x2 Chi-Square test and descriptive statistics. **Results:** In general, antibiotic prescribing at the 4 study clinics did not align with the 2013 pediatric guidelines. Of the patients who received guideline driven therapy, 5 failures occurred. Of the patients who received non-guideline driven therapy, 10 failures occurred. AOM relapse rates were not statistically different between those who received guideline driven therapies and those who received non-guideline driven therapies. **Implications:** Provider buy-in is key to transforming clinical practice. Historically, providers at study clinics have prescribed more costly, non-guideline driven therapies for improved adherence, palatability, and convenience with the purpose of decreasing AOM relapse rates. This data suggests that this prescribing practice does not decrease failure rates or improve patient outcomes. In the future, cost data should be collected and compared for each study group to determine if guideline-driven therapies would provide significant cost savings.

**Contribution of Pharmacy Academia in the Educational Research Output on Curricular Integration: A Bibliometric Study.** Rahmat M. Talukder, *The University of Texas at Tyler*, Mohammed A. Islam, *West Coast University*, Reza Taheri, *West Coast University*. **Objectives:** To assess educational research output on curricular integration in medical and pharmacy schools/colleges. **Method:** The Web of Science database was used to conduct literature search (1989—2016) using search terms “integration”, “curriculum”, “course”, and “curricular integration” combined with either “pharmacy” or “medicine/medical”. Retrieved articles were categorized by contributions from medical and pharmacy schools. Number of publications, citations, H-index, and research topics were analyzed using descriptive statistics. **Results:** A total of 504 articles were retrieved. Out of that, 285 articles meeting inclusion criteria were included. From 1996 to 2016, over 15 folds increase in number of publications were noticed. Contributions from medical and pharmacy schools were 68% and 32%, respectively. Medical school publications accounted for 73%, while pharmacy accounted for 27% of 1888 total citations. The H-index for publications from medical and pharmacy schools were 26 and 11, respectively. Course- and topic-level integrations were among the most studied topics (medical=108 and pharmacy=71). Sixty eight articles (medical 50 and pharmacy 18) addressed program-level curricular integration. The articles were published in 117 journals of which the American Journal of Pharmaceutical Education, Academic Medicine, and Anatomical Sciences Education constitute the top three journals with 22%, 6.3%, and 5.6% of the articles. In pharmacy, USA contributed to 76% of the publications, followed by Canada (11%), Australia (5.5%), Finland (3.3%), and other countries (4.2%). **Implications:** Publication on curricular integration has significantly increased during last decade. As pharmacy programs move towards integrated curricula, there is a significant opportunity for pharmacy to contribute to the body of literature in this area.

**Contributions of Pharmacy Academia to the Scholarly Output on Interprofessional Education: A Bibliometric Study.** Mohammed A. Islam, *West Coast University*, Rahmat M. Talukder, *The University of Texas at Tyler*, Reza Taheri, *West Coast University*. **Objectives:** To assess global educational research output on interprofessional education (IPE) and contributions of pharmacy relative to other healthcare academic programs. **Method:** The Web of Science database was used to search for following terms in titles and abstract between 1976 and 2016: “interprofessional education” or “interprofessional” combined with “education,” “course,” “curriculum,” and “healthcare.” Titles and abstracts of retrieved articles were reviewed for contributions from

pharmacy, medical, nursing, and other health professions. Number of publications, citations, H-index, and country contributions were analyzed using descriptive statistics. **Results:** A total of 1445 references were retrieved that met inclusion criteria. The number of publications increased exponentially during past eight years (1976-2007: 12% and 2008-2016: 88%). As of December 06, 2016, identified articles were cited 17,659 times with an H-index of 54. Top five healthcare education institutions contributing to IPE literature include: Medicine (25%), nursing (18.2%), pharmacy (7%), dentistry (5.5%), Occupational Therapy (4.9%), and Physical Therapy (4.8%). The journal contributing most was the Journal of Interprofessional Care (33%). The United States ranked first in number of publications (27%), followed by the Canada (17.5%), United Kingdom (16.1%), and Australia (10.2%). Implications: Growing trends in interprofessional practice has triggered increased emphasis on IPE across health profession curricula by respective accrediting agencies. While medicine and nursing are the leading contributors to this literature, pharmacy has significant opportunity to increase scholarly output on IPE.

**Correlation of Performance on Traditional and Open-Ended Examinations in a Pharmacotherapy Course.** Nathan A. Pinner, *Auburn University*, Kristen L. Helms, *Auburn University*. **Objectives:** The Integrated Pharmacotherapy (IP) sequence at Auburn University Harrison School of Pharmacy utilizes group oral examinations as part of the assessment package for the course. Recently, a written plan assessment (WPA) was integrated into this examination to align our assessments with our teaching methodology, problem-based learning (PBL). Students are provided a patient case with two disease states and asked to create a comprehensive plan with access to resources allowed for class. We sought to evaluate the performance of students on the WPA as compared to performance on the traditional examination (TE). **Method:** Exams scores from IP Phase 2 were reviewed and linear regression was performed to determine if performance on the TE was predictive of performance on the WPA. We also specifically evaluated the students scoring < 70% on the TE to assess their performance on the WPA. **Results:** Mean scores were 75.88 and 80.93 on the TE and WPA, respectively. Performance on the TE was predictive of performance on the WPA ( $P < 0.0002$ ), but with a high degree of variability about the line ( $R^2 = 0.085$ ). Sixty-five percent (17/26) of the students scoring <70% on the TE scored >70% on the WPA. **Implications:** Performance on the TE was predictive of scores on the WPA, but changes were minimal. Further investigation into the characteristics of students that excel on the WPA, but struggle on the TE is warranted. The weight placed on assessments regarding the application of skills learned in the PBL sequence versus traditional knowledge-based exams must be re-examined.

**Curricular Redesign to Incorporate Point-of-Care and Self-Assessment Components Into a Clinical Assessment Course.** Heather Folz, *Notre Dame of Maryland University*, Tracy Sprunger, *Butler University*. **Objectives:** To evaluate the impact of point-of-care labs and self-assessments on first year pharmacy (P1) students' confidence to assess common laboratory values and disease prevention measures. **Method:** As a new laboratory experience in a P1 clinical assessment course, students collected results from point-of-care lipids, blood glucose, A1C, body composition, and blood pressure while concurrently being introduced to the major guidelines corresponding with these areas in the classroom. Participants demonstrated the collect and assessment components of the Pharmacists' Patient Care Process (PPCP) through assessment of their own health by completing a medical health note and lifestyle goal reflection journal. Survey instruments were administered prior to and after the implementation of the program.

The primary endpoints were changes in confidence in assessing a patient's A1C, blood pressure, lipids, diet, body composition, physical activity, vaccine status, and goal setting strategy using a paired t-Test with an alpha of less than 0.05 indicating statistical significance. **Results:** Ninety-three P1 students (84%) completed both the baseline and follow up survey instruments. Confidence to assess all primary endpoint increased significantly ( $p < 0.001$ ). **Implications:** This program provides an example of how to teach fundamental data collection and assessment skills in a meaningful way using a system based approach as outlined in the PPCP. This curricular redesign may serve as a feasible, innovative model for other health curriculums seeking to use active learning to promote self-awareness and patient assessment skills.

**Description and Evaluation of an Event to Promote Careers in Clinical Pharmacy.** Robert Mueller, *Concordia University Wisconsin*, Sarah Ray, *Concordia University Wisconsin*, Andrew Ticcioni, *Ascension St. Joseph*, Amy M. Suss, *Medical College of Wisconsin*. **Objectives:** Describe the development and execution of the Exploring Careers in Clinical Pharmacy event and evaluate its impact. **Method:** Members of Greater Milwaukee College of Clinical Pharmacy (GMCCP) designed didactic and discussion-based content for a free event to introduce clinical pharmacy to current and pre-pharmacy students. Students from three schools of pharmacy and multiple colleges offering pre-pharmacy courses were invited. GMCCP pharmacist members, along with a current pharmacy student and resident, served as presenters. Participants were asked to complete pre-event and post-event surveys to assess their awareness of and interest in clinical pharmacy. Volunteer pharmacists were also surveyed after the event. **Results:** Twenty-eight students attended the event. Nineteen students completed both the pre- and post-surveys: 8 pre-pharmacy and 11 current pharmacy students. Median pre- and post-event scores were analyzed with the Wilcoxon Signed-Rank test. Students' awareness and knowledge of clinical pharmacy improved after attending the event. Students' interest in a career in clinical pharmacy also increased. Nine of the thirteen volunteer pharmacists (69%) responded to the post event survey. The majority strongly agreed the event was well designed. Respondents also strongly agreed that participants asked meaningful and appropriate questions and were interested in learning about their area of practice. **Implications:** A clinical pharmacy event organized by a pharmacy professional organization for pre-pharmacy and pharmacy students increased awareness of available career opportunities. This event can be replicated by other organizations or schools of pharmacy seeking to increase prospective student interest and enrollment.

**Design and Implementation of an Elective Career Planning Course for Pharmacy Students.** Kelly M. Shields, *Ohio Northern University*, Jennifer Grundey, *Ohio Northern University*. **Objectives:** The Accreditation Council for Pharmacy Education Standards 2016 encourage student pharmacists to examine and reflect on attributes necessary for professional and personal growth. Data from an AACP survey of recent graduates also indicated perceived deficiencies in career planning. Therefore, an elective course was created for 5th year students (0-6 program) to encourage self-assessment and preparation for post-graduate employment and personal development. The objective of this poster is to describe important elements of this course to aid faculty at other institutions. **Method:** The course was designed after review of publications regarding career advancement and life-skills. Additionally, business faculty who had taught similar courses were consulted. The course has been team-taught for five years by two pharmacy faculty with speakers including business faculty, advanced pharmacy practice experience students, alumni and a financial planner.

Topics and assignments have been revised based upon course feedback and past student suggestions. **Results:** Qualitative data is collected throughout and at the culmination of the course utilizing feedback cards, class discussion, and an online survey. Data collected through course evaluations show that 100% of students “agree” or “strongly agree” that they “gained an important skill set” by taking the course. Additional assessments include comparing students’ reported confidence and knowledge before and after the course and placement data upon graduation for students taking this course with those who did not. **Implications:** This course is easily implemented, well-received by students, and encourages student learning and development while also improving confidence in the area of personal and professional planning.

**Design, Implementation, and Assessment of a Program to Equip PharmD Students for Postgraduate Training.** William A. Prescott, *University at Buffalo, The State University of New York*, Fred Doloresco, *University at Buffalo, The State University of New York*, Edward M. Bednarczyk, *University at Buffalo, The State University of New York*, Gina M. Prescott, *University at Buffalo, The State University of New York*, Erin M. Slazak, *University at Buffalo, The State University of New York*, Ashley Woodruff, *University at Buffalo, The State University of New York*, Nicholas Norgard, *University of Missouri-Kansas City*. **Objectives:** To assess residency placement and student perceptions of a “Scholars Program” (SP) designed to equip Doctor of Pharmacy (PharmD) students for postgraduate residency training. **Method:** The SP was introduced to provide advanced training and mentoring to select second, third, and fourth year PharmD students having an interest in postgraduate training. The SP consists of: (1) mentoring, (2) elective coursework encompassing clinical practice, teaching, and leadership, (3) modified experiential education, (4) journal club, (5) teaching assistant duties, (6) scholarship, and (7) professional presentations. Fisher’s exact and Chi-squared tests were used to compare residency match rates and residency placement rates (match/scramble) of SP students to non-SP students and match rates of SP students to national match data. An online evaluation was distributed one month prior to graduation to assess student perceptions. **Results:** Thirty students completed the SP (2013-2016), 28 of whom pursued residency training. Residency placement was 92.9% (26/28) in the SP group vs. 69.0% (78/113) in the non-SP group ( $p=0.0086$ ). The match rate was 85.7% (24/28) in the SP group vs. 62.8% (71/113) in the non-SP group ( $p=0.024$ ) and 67.0% (10,622/15,864) nationally ( $p=0.035$ ). The majority of students agreed the SP helped them attain a postgraduate training position (86.7% “agreed” vs. 6.7% “disagreed”) and that the SP prepared them for postgraduate training (86.7% “agreed” vs. 3.3% “disagreed”). Ninety percent indicated they would recommend the SP to students interested in postgraduate training. **Implications:** PharmD students that completed the SP experienced improved residency match and placement rates, and viewed the SP as valuable preparation for postgraduate training.

**Designing a First Year Ambulatory Practice Experience to Emphasize the Pharmacists’ Patient Care Process.** Keri D. Hager, *University of Minnesota*, Anita Sharma, *HealthEast*, Kristin K. Janke, *University of Minnesota*. **Objectives:** To develop, implement, and evaluate an early practice experience that was a consistent and logical extension to first-year coursework focusing on the pharmacists’ patient care process (PPCP). **Method:** To ensure a quality, authentic experience, the course was implemented within a PPCP-committed health system and designed for a small number of students and new practitioners, whose practice was consistent with first-year curriculum. Six students were matched with five practitioners in five clinics, and spent

five half-days in clinic in the summer after their first professional year. Students interviewed patients to obtain their medication experience and completed post-clinic reflections about “lessons learned,” which were shared with peers online. Practitioners evaluated students using Entrustable Professional Activities (EPA). Students completed a post-course evaluation. Students and practitioners participated in separate post-course debriefing sessions. **Results:** As evidenced by EPA scores and successful assignment completion, all students achieved the desired learning outcomes of applying patient care skills and developing the skills of a reflective practitioner. Five students completing the post-course evaluation. All agreed or strongly agreed they are better able to bridge classroom patient care concepts with the realities of practice, and are more confident interviewing patients about their medication-related needs. All students would recommend this course to other students. Students and practitioners requested more orientation to aid in setting appropriate student expectations based on the first-year curriculum. **Implications:** Lessons from this course can be used by other institutions seeking to offer an early authentic experience for students to practice the PPCP in ambulatory care.

**Designing and Evaluating an Interprofessional Practice Experience Involving Dental and Pharmacy Students.** Jacqueline M. Theodorou, *Temple University*, Melissa E. Rotz, *Temple University*, Shannon Myers Virture, *Temple University Kornberg School of Dentistry*, Laurie MacPhail, *Temple University Kornberg School of Dentistry*, Maria Fornatora, *Temple University Kornberg School of Dentistry*, Elizabeth Tweddale, *Temple University Kornberg School of Dentistry*, Chizobam Idahosa, *Temple University Kornberg School of Dentistry*. **Objectives:** To prepare pharmacy and dental students to collaborate as members of an interprofessional team by participating in an interprofessional practice experience. **Method:** An interprofessional practice experience was implemented within a dental admissions clinic. Pharmacy and dental students collaboratively conducted medical histories and provided tobacco cessation education. Pharmacy student performance was measured using a standardized assessment rubric, pharmacy and dental student perceptions were measured using a validated tool, and faculty feedback was captured for evaluation purposes. **Results:** Pharmacy students achieved performance expectations upon completion. Student perceptions of interprofessional collaboration increased after completing the experience. Overall, faculty perceptions of the practice experience were positive. **Implications:** A collaboration between pharmacy and dental schools is a novel approach to meeting interprofessional and experiential curricular goals. Evaluating performance in practice experiences and perceptions can be utilized to demonstrate learner outcomes within interprofessional education. Furthermore, faculty feedback should be utilized to improve practice experiences.

**Developing a Web Application That Records Sign-in Time and Student Location for Small Group Meetings.** Gary D. Theilman, *The University of Mississippi*, Courtney S. Davis, *The University of Mississippi*. **Objectives:** Student attendance at small-group discussions was previously recorded using paper sign-in forms. There were reports that faculty would sometimes allow tardy students sign-in late. Our goal was to develop an accurate attendance recording process that would shield faculty from pressure and minimize sign-in fraud. **Method:** Faculty used a computer in each meeting room to login to a web-based application we developed that displayed a list of expected students. The application created an encrypted URL that uniquely identified the meeting time and a QR code that led to the same link. Students used their cell phones or other electronic devices to either scan the QR code or manually browse to the URL. Their device then



prompted the student to enter a PIN number. The time and the device's current location were displayed next to their name on the computer screen in the room. Students who did not sign in on-time were expected to submit documentation explaining their absence. **Results:** Over 3 semesters, the system processed 22,357 sign-ins and identified 146 absences/tardies. Students who signed in late were flagged by the system for review. There was no evidence that students signed in for group members not there. We stopped displaying the student's current location on the room's screen because of inaccuracies in their phones' position tracking. Continuing challenges include faculty rescheduling their groups without notifying staff in time to update the schedule. **Implications:** The system accurately recorded attendance and shielded faculty from student pressure to allow late sign-ins.

**Development and Evaluation of a General Medicine Elective Course.** Alexa A. Carlson, *Northeastern University*, Margarita V. DiVall, *Northeastern University*, Mark Douglass, *Northeastern University*, Michael Gonyeau, *Northeastern University*, Jason W. Lancaster, *Northeastern University*, Stephanie L. Sibicky, *Northeastern University*, Adam B. Woolley, *Northeastern University*. **Objectives:** To describe the design and evaluation of a new Principles of General Medicine elective course. **Method:** A focused, curricular review substantiated interest in the development of a two-credit elective, which included an exhaustive literature review and professional experiences of general medicine faculty preceptors. The elective was designed to provide P3 students with opportunities to apply knowledge and skills learned throughout several required courses and to refine skills necessary for advanced pharmacy practice experience (APPE) success. A flipped classroom methodology was utilized to simulate self-directed learning expectations of APPEs. The pharmacist patient care process (PPCP), management of multiple patients, interprofessional collaboration, transitions of care, drug therapy problem evaluation, continuous professional education, and drug information skills were emphasized throughout. Outcomes data from knowledge-based (quizzes), performance-based course assessments (clinical pearl write-up, three patient presentations, and class participation), and end-of-course student evaluations were analyzed. **Results:** A total of 36 students have completed this course since 2016. Exam and rubric-graded assessment data from ExamSoft® exceeded our pre-specified performance benchmark of 80% achievement of covered Center for the Advancement of Pharmacy Education outcomes and skills related to PCPP. All students successfully passed the course (average grade 91%). End-of-course student evaluations demonstrated a high-level of course satisfaction overall. **Implications:** Our general medicine elective course fosters the development of P3 students to prepare them for APPEs and can be adopted by other programs.

**Development and Evaluation of a Pilot ESL Communications Course in Preparation for APPEs.** Mark S. Johnson, *Shenandoah University*, Salma Tewfik, *Shenandoah University*, Dylan Pack, *Shenandoah University*, Regina F. Peacock, *Shenandoah University*. **Objectives:** The objective of this study was to evaluate the benefit of a pilot English as a second language communications course for student pharmacists and to develop a student services plan for non-native English speakers who may struggle with communications. **Method:** Ten student pharmacists in their fourth professional year were identified and voluntarily participated in a non-credited course to improve communications in preparation for Advanced Pharmacy Practice Experiences (APPE). Evaluation of the course included course surveys, personal reflections, scored assignments, as well as scores and comments from APPE rotations. **Results:** Post-course survey responses indicated an improvement in self-confidence in verbal communication

skills and all student reflections reported the course as beneficial. In addition, several students recommended offering this earlier in the curriculum. All students successfully completed their APPE rotations with verbal and written communication skills rated by preceptors as predominantly competent or proficient. **Implications:** With an increase in the non-native English speaking population in the United States, particularly those training to be healthcare professionals, it is important to offer student services in Schools of Pharmacy that foster good verbal and written communication skills. Increasing opportunities for communication practice in the standard pharmacy curriculum will better prepare non-native English speaking students to communicate in pharmacy practice settings and will improve their confidence in communicating with patients and other healthcare professionals. The information obtained from this pilot course will be used, in collaboration with an ESL education expert, to develop a credited ESL elective for second-year student pharmacists.

**Development and Implementation of SBIRT Interprofessional Training for Pharmacy, Nursing, and Mental Health Counseling Students.** Anthony Corigliano, *St. John Fisher College*, Katherine M. Juba, *St. John Fisher College*. **Objectives:** To develop an interprofessional training on the use of SBIRT (screening, brief intervention and referral to treatment) to address substance misuse. **Method:** Pharmacy, nursing, and mental health counseling faculty along with a local motivational interviewing expert developed a 4 hour on-line motivational interviewing and SBIRT training module and a 6 hour interprofessional education (IPE) training day content. The IPE training day consisted of a variety of exercises designed towards an integrated model of care including an ice breaker discussion about drug and alcohol use, three SBIRT clinical implementation videos, a patient testimonial about their personal experience with drug and alcohol abuse, SBIRT application using a standardized patient (SP) case, and facilitated group SBIRT interview debriefing. Students completed a five point Likert scale SAMHSA survey to assess course quality, practice relevance, information usefulness, and effectiveness. **Results:** One hundred and fifteen students completed the spring 2016 training and 97 students submitted their evaluation. Overall course quality satisfaction was 69% (strongly agree/agree), 24% (neutral), and 7% (strongly disagree/disagree). Perceived practice relevance was 81% (strongly agree/agree), 15% (neutral), and 3% (strongly disagree/disagree). Usefulness of course information was 76% (strongly agree/agree), 20% (neutral), and 4% (strongly disagree/disagree). Students' perception of current effectiveness was 52% (strongly agree/agree), 33% (neutral), and 15% (strongly disagree/disagree). **Implications:** Drinking and drug use increases the risk for chronic disease, safety, and social issues. Training designed to enhance healthcare providers' skills can build confidence in identifying and preventing further misuse.

**Development and Implementation of a Community Enrichment Elective to Meet Co-Curricular Outcomes.** Ann Zweber, *Oregon State University*, Addison Pang, *Oregon State University*, Riley Protz, *Oregon State University*, Isip Leah, *Oregon State University*, Tyler Main, *Oregon State University*, Jenny Chan, *Oregon State University*, Hoang Ho, *Oregon State University*, Megan Eckrich, *Oregon State University*, Kayla Burnette, *Oregon State University*. **Objectives:** The College of Pharmacy collaborated with local Boys and Girls Clubs (BGCs) to design and implement lessons to improve health literacy among club participants. Student leaders worked with a faculty member to design a course focused on CAPE Outcomes, domains 3 and 4, and provide effective instruction on health topics to BGC participants. **Method:** Seven student learning outcomes (SLOs) were identified for the two-credit elective. SLOs were based on CAPE outcomes in the

educational, communication and leadership domains. P3 and P2 student leaders prepared instructional materials and assessments for BGC participants, then trained P2s enrolled in the elective to deliver weekly lessons to small groups at 4 different local BGCs over a 6 week period. Achievement of course SLOs was assessed through a course assessment survey, and self-reflection essays. BGC participants were given pre- and post-surveys to measure learning. **Results:** Twenty-five P2s participated in the course. Nineteen students completed the course evaluation. The majority of students marked all SLOs as Met. No SLO was marked as Not Met. Reflection papers described how each of the SLOs was achieved. Pre- and post-surveys for BGC participants indicated an increase in knowledge. **Implications:** Co-curricular goals focused on leadership, community engagement, and communication can be achieved through partnerships with local organizations. The achievement of learning objectives for both pharmacy students, and BGC participants supports a program that benefits both groups.

**Development of a Longitudinal Course Sequence to Address Personal and Professional Development.** Diane B. Ginsburg, *The University of Texas at Austin*, Jennifer L. Ridings-Myhra, *The University of Texas at Austin*, Donna M. Burkett, *The University of Texas at Austin*. **Objectives:** Describe the development of the Foundations of Professional Development (FPD) course sequence to promote personal and professional development of students, discuss the FPD six core modules, and review longitudinal assessment methods used to evaluate and monitor student development. **Method:** The FPD Subcommittee reviewed and revised content from all existing professional development courses to assure they meet or exceed the 4 domains of the CAPE 2013 Educational Outcomes, with a focus on Domain 4, and ACPE Standards 2016, Standard 4. Among other curricular objectives, the subcommittee determined that the FPD course sequence would serve as the foundation and home for interprofessional education in the college. The course sequence was expanded to allow for a more systematic and structured approach to personal and professional development as well as longitudinal assessment of development throughout the curriculum. **Results:** The FPD course sequence was implemented in fall 2016, and is comprised of a six course sequence that serves as the major curricular “home” for addressing and assessing Standard #4. Use of web-based portfolios has provided a mechanism for students to assess development longitudinally. Student portfolios and posted weekly reflections are reviewed by faculty mentors who provide feedback and guidance on student personal and professional development. Students utilize their portfolios and mentor input to assist with co-curricular engagement and career planning. **Implications:** The FPD courses are designed to promote students’ personal and professional development. The FPD course sequence has facilitated a more purposeful and intentional engagement with the curricular and co-curricular components of our program.

**Development of a Micro-Credentialing Framework for Pharmacogenomics Education.** Jing Zhu, *University of Pittsburgh*, Solomon M. Adams, *University of Pittsburgh*, James M. Stevenson, *University of Pittsburgh*, James C. Coons, *University of Pittsburgh*, Lucas Berenbrok, *University of Pittsburgh*, Lorin B. Grieve, *University of Pittsburgh*, Philip E. Empey, *University of Pittsburgh*. **Objectives:** In emerging sciences such as pharmacogenomics (PGx), there is wide variability in depth and breadth of training and indicators of skill attainment are not easily validated and shared. Micro-credentialing offers a mechanism to demonstrate competencies, keep records of learner’s achievements and share attained skills with others. Our goal was to develop and deploy a PGx micro-credentialing framework to support PharmD curricula and continuing education programs.

**Method:** Consensus PGx foundational competencies from the G2C2 (Genetics/Genomics Competency Center) were adapted to learner audiences (PharmD students and community pharmacists). Micro-credentials (digital badges) were developed for each competency domain and mapped to required training and performance-based assessments. Processes for awarding badges within an existing credentialing ecosystem were developed and integrated into a pharmacogenomics training program. **Results:** A progressive micro-credentialing framework applicable to multiple learning formats and target audiences was created. 27 competencies (the 15 from G2C2 and 12 additional that were created for the target audiences) were grouped into five domains. Educational materials and respective performance-based assessments were developed and deployed to assess each competency in the PharmD curriculum and a nationally deployed PGx education program (n=435 learners thus far). Digital badges become available at completion of each domain (each stage of achieving competencies deemed essential) and completion of each domain culminated in a final mastery credential. **Implications:** Micro-credentialing is a feasible approach for recognizing learner PGx competencies. Future work is aimed at understanding the downstream usage and value of micro-credential/digital badging.

**Development of a Pharmacy Faculty/Student-Led Medication Literacy Workshop for Refugees.** Gina M. Prescott, *University at Buffalo*, *The State University of New York*, Sarah Dascanio, *University at Buffalo*, *The State University of New York*, May Shogan, *International Institute of Buffalo*. **Objectives:** Refugees entering the U.S. healthcare system typically have limited health literacy and medication knowledge. The objective of this program was to develop a community based educational workshop to improve medication literacy in refugees. **Method:** One faculty member and one PharmD/MPH student met with refugee community leaders to conduct a medication literacy needs assessment for their local population. A literature review was also completed to review best practices. A medication literacy workshop composed of the following was developed: small group presentations, hands-on demonstrations, a skit about navigating a pharmacy, brochures, and a post-workshop evaluation. Presentation topics included: medication safety, importance of taking medications, and reading a medication label. To optimize communication, all materials were translated into multiple languages and interpreters were utilized. A one-hour training session for pharmacy students (P1-P4) was created to equip them to lead group discussions at the workshop. **Results:** Twenty-six pharmacy students have been trained to administer the workshop. Five workshops were offered during the 2016 calendar year, through which 130 refugees from over 23 countries were educated. Workshops were provided at a local resettlement agency (n=2) or at a local English as a Second Language Classes (n=3). The workshop has received positive commentary feedback from the participating refugees and students. Any refugee who did not successfully meet the evaluation criteria were individually instructed until the criteria were met. **Implications:** This program provided refugees with basic necessary medication information. It may help the refugees who are first entering the healthcare system to become familiar with medication aspects in the US.

**Differences in Priority Placed on Scholarship for Pharmacy Practice Faculty Seeking Promotion.** Chelsea Campbell, *University of South Carolina*, Jason E. Lockhart, *University of South Carolina*, P. Brandon Bookstaver, *University of South Carolina*. **Objectives:** Differences in priority placed on scholarship in promotion criteria for practice faculty are often discussed but have not been formally evaluated among Colleges of Pharmacy (COPs). **Method:** This was an

observational study and was exempted by the IRB. The primary end-points were to determine the overall priority of scholarship in promotion criteria from Assistant to Associate level and whether differences exist among COPs (public vs. private; legacy (>10 years since inception) vs. non-legacy). ACPE-accredited COPs as of July 2016 were eligible for inclusion. Promotion criteria were searched and retrieved electronically or through direct inquiry. The magnitude of scholarship priority was evaluated using a 7-item rating tool developed by study investigators categorizing as follow: low (score of 0-2), moderate (3-5), and high (6-7). **Results:** Of 127 programs, data for 93 (73%) were available including 54 public (58%) and 39 private (42%) institutions. Seventy-nine (85%) were considered legacy programs. Low, medium and high scholarship priority was observed among 26%, 46% and 28% of COPs, respectively. The median scholarship priority score was 4 and was not different between public and private institutions. Slightly more private institutions scored in the low priority range (28% vs. 22%,  $p=NS$ ). The highest scholarship priority (score=7) was observed in 11% of public institutions compared to 2.5% of private institutions ( $p<0.05$ ). **Implications:** Approximately one-quarter of COPs placed high priority on scholarship for promotion from Assistant to Associate professor based on our rating tool. A disproportionate amount of private institutions and newly launched institutions were excluded which may limit interpretation.

**Educating International Students About Pharmacy in the US: A Pilot Project.** Brenda Shen, *The Ohio State University*, Hyun-Su H. Kim, *The Ohio State University*, Renee Bishai, *The Ohio State University*, Chelsea Pekny, *The Ohio State University*, Jennifer L. Rodis, *The Ohio State University*. **Objectives:** 1) Assess perspectives of international students enrolled at a large, public university campus following an education session on US medication use process. 2) Share commonly asked questions by attendees. **Method:** The Ohio State College of Pharmacy and Office of International Affairs collaborated to present the pharmacy system in the US during campus-wide international student orientation. The role of pharmacists, difference between over-the-counter vs. prescription as well as generic and brand-name medications, proper use of liquid measuring devices, the concept of refills, and payment/insurance were discussed. Anonymous, voluntary, hard copy surveys were completed post-presentation, and the gathered data was analyzed using descriptive statistics. Participant questions were categorized to identify common themes. **Results:** A presentation was provided at seven orientation sessions between August 5, 2016 and August 17, 2016 with 1496 completed surveys collected. Greater than or equal to 1373 (92%) students strongly agreed/agreed with each of the following statements: This presentation is helpful; I feel comfortable coming to the pharmacy to fill a prescription; I feel comfortable asking questions to the pharmacy staff; I understand the difference between over-the-counter and prescription medications; I understand the difference between brand and generic medications. Most frequent questions that arose included inquiries on availability of local and university pharmacies/pharmacists, health insurance coverage and cost, available vaccinations at a pharmacy, and recommendations on over-the-counter products. **Implications:** This educational model may be used in similar settings to share information on navigating the US community pharmacy system, access to medications, and safe usage of medicines.

**Education on Complementary and Alternative Medicine in Pharmacy Curriculum.** Mikiko Y. Yamada, *The University of New Mexico*, Kristina M. Wittstrom, *The University of New Mexico*, Barry Bleske, *The University of New Mexico*. **Objectives:** Evidenced-based evaluation of complementary and alternative medicine is necessary in

pharmacy education since a pharmacist is expected to be a reliable information resource to counsel patients about safety and efficacy of herbs. In this study, we investigated if 1) the Consolidated Standards of Reporting Trials (CONSORT) guideline is effective for students to analyze an article on herbal medicine and if 2) the Clinical Practice Guideline Process (CPGP) Manual by American Academy of Neurology was effective for students to determine level of evidence of an herb. **Method:** Three groups of students (4-5 students/group,  $N=14$ ) were asked 1) to analyze an article about an assigned herb for a neurological disease using the CONSORT guideline, and 2) to classify the article as Class I to IV according to the CPGP Manual, considering study design and key information described in the article. The evidence levels were classified Level A, B, C, or U depending on number of Class I, II, III, or IV studies. Before and after the group activity, a survey was conducted to identify the effectiveness of the tools using a Likert scale. **Results:** The tools increased students' confidence level in counseling patients and healthcare providers regarding an herb ( $p=0.002$ ) and its evidence ( $p=0.001$ ) and increased their confidence level in identifying the level of evidence of an herb for a specific disease state ( $p=0.016$ ). **Implications:** The CONSORT guideline and the CPGP Manual were useful tools for students to identify level of evidence for herbs, and students' confidence level in making these analyses increased.

**Educational Gaming: Design of a Diabetes Themed Escape Room.** Heidi Eukel, *North Dakota State University*, Jeanne E. Frenzel, *North Dakota State University*, Dan Cernusca, *North Dakota State University*. **Objectives:** The 2013-2014 AACP Academic Affairs Committee encouraged the development of serious games in pharmacy education. To complement and reinforce nine hours of prior didactic instruction, an innovative educational game, the diabetes escape room, was designed and assessed. **Method:** Faculty developed an escape room with a series of four complex puzzles focused on diabetes emphasizing hands-on exploration of products. The goal for student teams was to solve the series of puzzles through demonstration of skills and escape the room. The research team used a cross-sectional pretest-posttest to assess students' changes in knowledge. Both the analysis of kurtosis and skewness as well as the QQ plots indicated an acceptable level of normality. To test the hypothesis that the gaming activity engaged students in expanding their knowledge base from a given set of prior knowledge, researchers used a simple regression analysis. **Results:** The basic statistics for students' pre and post knowledge scores showed a pre-treatment knowledge mean of 56.19% and post-treatment knowledge mean of 81.39%. A statistically significant positive regression coefficient,  $\beta=0.46$ ,  $t(71)=4.3$ ,  $p<0.001$ , indicated a positive impact of pre knowledge scores. A paired t-test indicated that students' mean score for the post knowledge assessment was statistically significantly higher than pre knowledge assessment  $t(72)=-18.1$ ,  $p<0.001$ . **Implications:** As shown in the literature, gaming promotes both engagement and persistence on task, two critical conditions for deep learning. The results of this study indicate that the diabetes escape room led to increase in student knowledge.

**Effectiveness and Perceived Benefit of a Structured Tool to Guide First Year Pharmacy Student Self-Reflection.** Renee McCafferty, *Manchester University*, Holly D. Robison, *Manchester University*. **Objectives:** To assess the OSAP (Objective, Subjective, Assessment, Plan) method for improving student confidence in self-reflection by comparing self-reflection quality on a series of assignments and evaluating pharmacy student perceptions of the OSAP method. **Method:** All students enrolled in a first year pharmacy practice laboratory course were given three self-reflection assignments. Students

completed the first assignment with no guidance. Students were then introduced to the OSAP method and the method was applied to the second and third assignments. Lab faculty assessed self-reflections and provided constructive feedback regarding use of the OSAP method. Investigators developed a survey to gather student perceptions of the OSAP method, utilizing Likert scale evaluative statements and an open-ended comments section. The survey evaluated student perceived confidence before and after using OSAP and student perceptions of the method. Retrospective pre/post testing of student confidence was used. Survey data and student self-reflection scores were analyzed using Wilcoxon signed-rank test and descriptive statistics. Reflection assignment scores were analyzed by Kruskal-Wallis. **Results:** Mean student scores on reflection assignments one, two, and three were 56%, 73%, and 92%, respectively ( $H = 84.4, p < 0.001$ ). On the survey, student confidence in self-reflection was found to be significantly higher after using the OSAP method ( $Z = -3.093, p = 0.002$ ). **Implications:** The OSAP method was perceived by students as helpful in facilitating reflective thought. Student self-reflection scores improved, suggesting that continued use of the OSAP method and faculty review of self-reflection structure may be key components to improving student self-reflection.

**Effectiveness of Peer-to-Peer Teaching Through a Mentored Patient-Case Building Activity.** Marina Suzuki, *Pacific University Oregon*, Ryan Gibbard, *Pacific University Oregon*, Danielle Backus, *Pacific University Oregon*, Pauline Low, *Pacific University Oregon*, David Fuentes, *Pacific University Oregon*. **Objectives:** To examine the effectiveness of student-created patient case presentations as a learning activity to teach peers during a two-week pharmacotherapy course. **Method:** Fourteen groups of 6-7 students developed a patient case and conducted a 30-minute presentation in class. A template to incorporate key components of the patient case presentation was provided, and a faculty mentor was assigned to each group to offer individualized guidance. Each group was responsible for writing one case-based multiple-choice question, and classmates submitted their answers before and after attending the respective presentations. Student feedback was collected with Qualtrics. **Results:** Ninety-six students participated and submitted their answers to at least one pre- and post-presentation question. A total of 2,435 responses were submitted among 96 students for 14 pre/post-presentation questions. For 7 out of 14 questions, a significantly greater number of students submitted correct answers at post-presentation, compared to pre-presentation ( $p < 0.0035$ ). The percentage of correct answers improved from  $52 \pm 17\%$  at pre-presentation to  $70 \pm 15\%$  at post-presentation ( $p < 0.001$ ; mean  $\pm$  standard deviation). Seventy-six students provided feedback, of which 65 (86%) responded that attending case presentations reinforced the information. Fifty-eight students (76%) identified that writing the pre/post-presentation question helped them to recognize key information in their presentation while 57 students (75%) responded that answering these questions helped them to focus during the presentation. **Implications:** Students were able to learn from patient case presentations prepared by their peers. Students identified that both writing and answering case-based questions were helpful for their learning.

**Effects of Student GRIT on Early Intervention and Academic Progression.** Courtney A. Robertson, *The University of Louisiana at Monroe*, Elizabeth M. Lafitte, *The University of Louisiana at Monroe*, Corey M. Guidry, *The University of Louisiana at Monroe*, Adam Pate, *The University of Louisiana at Monroe*, David J. Caldwell, *The University of Louisiana at Monroe*. **Objectives:** To assess the relationship between GRIT survey scores and need for early academic intervention (EI) in Principles of Drug Action course, and to evaluate the change in

exam average for upper and lower GRIT score quartiles and subscale scores. **Method:** The GRIT 12-item survey was administered to the current P1 class prior to admission; overall GRIT and subscale (consistency of interest and persistence of effort) scores were recorded. The current threshold for EI is any exam score  $< 70\%$  with a course average  $< 70\%$ . Multiple logistic regression and Mann-Whitney U analyses with  $\alpha = 0.05$  were used to determine potential contributing factors toward EI. **Results:** Mean GRIT scores were similar ( $p = 0.14$ ) among students requiring EI (4.28,  $n = 31$ ) versus others (4.25,  $n = 47$ ). Higher GRIT scores negatively correlated with qualification for EI (OR = 0.59;  $p = 0.46$ ). For students requiring EI, no statistically significant difference was seen in average change in exam scores between the upper and lower GRIT quartiles with slopes of 3.84 and 0.97 ( $p = 0.12$ ). The average score change in upper and lower quartiles of GRIT subscale scores was not significantly different for consistency of interest (mean 2.65 versus 1.3;  $p = 0.2$ ) or persistence of effort (mean 3.99 versus 2.83;  $p = 0.5$ ). **Implications:** Although not statistically significant, the relationships observed and correlations to other academic factors will be used in future research to validate GRIT score interpretations and its utilization with other predictors of academic success.

**Employment Characteristics of Pharmacy Graduates Completing Post-Graduate Training.** Rosalyn P. Vellurattil, *University of Illinois at Chicago*, Nicole K. Ozturk, *University of Illinois at Chicago*, Marieke D. Schoen, *University of Illinois at Chicago*. **Objectives:** The UIC College of Pharmacy tracks pharmacy graduates annually to determine employment characteristics. Many graduates at this institution pursue postgraduate training. The objective is to assess employment characteristics of graduates completing PGY1 residencies at graduation, and one year later following the residency. **Method:** Survey data was used to identify characteristics and employment associated with graduates obtaining PGY1 residency positions from the classes of 2014 and 2015. Graduates completing PGY1 residencies were again surveyed approximately one year later to identify post-residency plans. **Results:** A total of 396 graduates completed the first survey (241 female, 152 male; mean age at graduation  $27 \pm 3.3$  years). Fifty-four graduates (30%) in the class of 2014, and 62 (31%) in the class of 2015 pursued PGY1 residencies. Of those, 76% ( $n = 41$ ) of the class of 2014, and 53% ( $n = 33$ ) of the class of 2015 responded to the second survey. Fifty-four percent of PGY1 residency graduates of the class of 2014 planned to pursue employment, while 58% of the class of 2015 planned to pursue PGY2 training. Of those pursuing employment from the class of 2014 ( $n = 22$ ) and 2015 ( $n = 13$ ), 41% and 38%, respectively entered hospital pharmacy practice. A total of 33 PGY1 residency graduates from both classes entered PGY2 residencies; most commonly in oncology ( $n = 6$ ), organ transplant ( $n = 4$ ), and emergency medicine ( $n = 7$ ). **Implications:** In addition to informing an institution on the employment characteristics of graduates and opportunities in pharmacy, post-residency employment data can be used for marketing geared towards prospective students.

**Enriching Service Learning Through Collaboration: A Community Partner Service Learning Course.** Michelle R. Musser, *Ohio Northern University*. **Objectives:** Service learning expands care opportunities for students, but enhancement through a partnership program allows for broader skill development. A community partner program where local agencies were paired with students to provide service activities within a service learning course was initiated to enhance student learning and expand community programming. **Method:** A group of students from multiple levels within a professional PharmD program were paired with a local community agency in a medically

underserved area. Outcomes from activities were recorded. Student and agency representative perceptions on the impact of the program were assessed with a survey at course conclusion. **Results:** Twenty students and three agencies were involved in the initial program offering. One group facilitated three events reaching approximately thirty patients. Other groups developed materials for future implementation. A survey of agency representatives indicated all would participate in the program again and would recommend it to others. Agencies felt the program allowed expansion of programming. Most students (95%) agreed that participation enhanced their outreach experience and understanding of outreach impact. Interactions among parties were positive. Allowing more time to implement projects was a noted improvement needed in the program. **Implications:** The community partner program was found to be beneficial for both students and community agencies, supporting continued offering and plans to expand involvement to lower-level students, other health profession students, and additional community agencies. Making the program a year-round offering will allow more time to implement planned programming.

**Establishment and Evaluation of A Pilot Professional Healthcare Student Wellness Program.** Shawn Riser Taylor, *Wingate University*, Michelle R. DeGeeter, *Wingate University*, Jennifer A. Wilson, *Wingate University*. **Objectives:** To evaluate effectiveness and receptivity of a student wellness program at a school of pharmacy. **Method:** Student pharmacists on a satellite campus were invited to join a wellness program. Participants served as their own control in the pre-post intervention study. Baseline and four month vitals were obtained. Five health-related education sessions were offered during the study period. Each participant received a survey upon enrollment and at follow-up regarding current health status and general health knowledge. Descriptive statistics and logistic regression were performed. **Results:** Nineteen students enrolled in the program and 13 remain enrolled. Mean baseline characteristics were as follows: age 28 years old, body mass index (BMI) 26kg/m<sup>2</sup>, body fat 32%, waist circumference 34 inches. Approximately four months after enrollment, BMI, body fat and waist circumference did not change significantly; however, body fat did increase. Attendance at an education session did not influence changes in weight or body fat. In regards to survey responses, the majority of students felt they do not get adequate exercise, but do maintain a healthy diet (55.9 and 57.9%, respectively) and all participants expressed desire to improve current health. In contrast, the majority of students were unaware of the daily maximum added sugar and saturated fat recommendations (84.2 and 78.9%, respectively). **Implications:** Though enrollees did not see a significant change in BMI, body fat, or waist circumference, a wellness program may be helpful in providing information that would help improve student knowledge and provide incentive for changing their current health status.

**Evaluating Effectiveness of a Renewed PharmD Curriculum Implementation Using Exploratory Focus Group Design.** Minakshi Lahiri, *Wayne State University*, Justine S. Gortney, *Wayne State University*, Lynette R. Moser, *Wayne State University*, Candice Garwood, *Wayne State University*. **Objectives:** The objective of this exploratory study was to assess learning experiences of the P1-PharmD students during the Fall-2016 term to evaluate effectiveness of the newly implemented renewed curriculum. **Method:** For longitudinal evaluation of curricular effectiveness, focus group methodology was used to explore student perspectives of a renewed curriculum. Utilizing focus groups as a research method has wide acceptance in health-education settings. Purposive sampling was done to recruit participants (n=24) for this study. Three focus groups were facilitated by 6 moderators with pre-designed questions. Data sources included (1) handwritten notes/typed

notes from facilitator and co-facilitator (2) handwritten feedback from P1 students on a feedback sheet (3) audio recordings of each of the focus groups. The audio were transcribed, data from different sources were coded and analyzed to identify emerging themes and triangulated. **Results:** Participants expressed satisfaction with respect to achieving the learning objectives of the renewed curriculum and with faculty support. Some issues raised by participants included minimal scaffolding in a self-study pharmacy calculations portion, group assignment issues (large group sizes and peer evaluation), and need for improved access to and communication with some faculty members. **Implications:** The findings and recommendations from this study will be used to develop part of an action plan to revise the curriculum implementation for the next academic year. This method of evaluating curricular effectiveness using rich, qualitative data from focus groups offers a model for a performance improvement initiative that is easy to implement and could benefit many pharmacy programs across the nation.

**Evaluating Interprofessional Fast Forward Rounds for Transitions of Care Education.** Zachary N. Jenkins, *Cedarville University*, Laura Cummings, *Cedarville University*, Ashley Smith, *Cedarville University*, Mike Pelyhes, *Cedarville University*, William Matcham, *Cleveland State University*, Phillip Thornton, *Cedarville University*, Austin Lail, *Cedarville University*. **Objectives:** Having interprofessional student groups work together to solve patient cases may help address the IPEC 2016 competencies and enable collaboration across disciplines. Therefore, the objective of this project was to assess the impact of an interprofessional transitions of care (TOC) conference utilizing unfolding cases on interprofessional knowledge and attitudes of pharmacy and nursing students. **Method:** During the TOC conference, students completed unfolding patient cases within their respective health profession, interacted with a TOC panel of healthcare professionals, and completed a second unfolding patient case in interprofessional groups. Pharmacy and nursing students were given pre and post-test surveys (adapted from validated instruments) to measure changes in knowledge related to TOC (7 items) and attitudes towards interprofessional collaboration (18 items). Since the data were not normally distributed, Wilcoxon signed-rank tests were used to compare within-group pre-post data, and a Mann-Whitney-U was used to compare professions. **Results:** Pharmacy and nursing students had significant improvements in TOC knowledge and interprofessional attitudes (18 items, 11 items, respectively, all: 15, p<0.05). Pharmacy students showed significantly more improvement in professional attitudes than nursing student in 11 pre-test and 9 post-test items (p<0.05). Nursing students showed significantly more improvement in professional attitudes than pharmacy students in one pre-test and 2 post-test items (p<0.05). **Implications:** The results of this study suggest that this interprofessional activity was beneficial in improving interprofessional attitudes as well as TOC knowledge and could be beneficial to implement at other institutions.

**Evaluating a Novel Online and Mobile Platform for Collaborative Student Learning in a Therapeutics Course.** Conan MacDougall, *University of California, San Francisco*, Katherine Gruenberg, *University of California: San Francisco*, Joshua Garcia, *University of California, San Francisco*, Tina Brock, *University of California, San Francisco*. **Objectives:** To pilot a novel online and mobile platform (called PIVOT) to promote asynchronous collaboration on therapeutic decision-making and measure impact on student satisfaction and learning outcomes. **Method:** In a 3rd year Therapeutics course that includes conference-style case discussions, groups were randomly assigned to usual preparation (group SOAP sheet) or preparation using

the PIVOT platform. For the next topic (1 week later), groups were crossed over to the other condition. Students were surveyed each week on satisfaction with their (A) preparative and (B) in-person experiences. Group performance on examination items related to the two topics was compared. We used mixed-effects ordinal logistic regression, clustered by student and group, to estimate the effect of the preparation method on student satisfaction (measured via 1-5 Likert-type scale). **Results:** Student satisfaction was similar between groups for both preparative experience (median, PIVOT vs SOAP: 4 vs 4,  $p=0.31$ ) and in-person experience (median, PIVOT vs SOAP: 4 vs 4,  $p=0.91$ ). At the conclusion of the study, 56% (61/107) students preferred or strongly preferred the PIVOT app for preparation, 10% expressed no preference, and 34% preferred or strongly preferred the usual SOAP sheet. Examination scores were not significantly different between preparation method. **Implications:** A novel platform for student collaboration yielded satisfaction and examination performance comparable to standard approaches and was preferred by a majority of students. Additional features of the PIVOT platform related to positive and negative behaviors warrant further exploration.

**Evaluating the Physical and Nutritional Wellness of The Ohio State University College of Pharmacy Community.** James W. McAuley, *The Ohio State University*, Kristen Ricker, *The Ohio State University*, Caitlin Yocum, *The Ohio State University*, Megan Amaya, *The Ohio State University College of Nursing*, Bernadette Melnyk, *The Ohio State University College of Nursing*. **Objectives:** Ohio State promotes balanced lifestyles and student success through 9 dimensions of wellness including physical wellness that incorporates nutrition and activity. As wellness is important for faculty and staff who are part of the educational process, we assessed all members of our College of Pharmacy. Our objective was to assess the physical and nutritional wellness in our college community. **Method:** All PharmD students, faculty and staff were invited to complete an anonymous online survey. For this cross-sectional study, we inquired about physical and nutritional wellness via a series of questions that we developed. Consent was obtained via acknowledgment in the email invitation. **Results:** Of the 723 invited, 315 responded (response rate = 43.6%). Our sample was mainly students (73%) and predominantly female (65%). Our population was not optimal in their eating, sleeping and exercise habits as only 36% stated they consume at least 5 servings of fruit and vegetables daily, 52% described they get at least 7 hours of sleep per night and 41% reported they exercise at least 150 minutes per week. The main reason (76%) for not exercising routinely was a lack of time. Nearly one-third of the respondents (31%) considered themselves "overweight". Of the participants reporting their eating habits as not healthy, the majority (63%) stated that it requires too much time to eat healthy. **Implications:** Our data show a need for improvement in the physical and nutritional wellness of our college of pharmacy community. Efforts are underway to improve these important aspects in our students, faculty and staff.

**Evaluation of Curricular Changes in Pharmaceutical Calculations on Student Pharmacist Ability to Perform Practice-Based Calculations.** Renee McCafferty, *Manchester University*, Venkatreddy Nadiathe, *Manchester University*, Holly D. Robison, *Manchester University*. **Objectives:** To determine the effect of teaching calculations as a standalone course or being taught within a combined pharmaceuticals course on students' pharmaceutical calculations mastery, retention and confidence. **Method:** The impact of curricular change, from a combined calculations course to stand-alone pharmaceuticals and pharmacy calculations courses was evaluated between two groups of student pharmacists. Data compared between the two groups include course

grade, OSCE score, and score on an independent calculation skills test. These performance measures were compared to students' prepharmacy math GPA to help determine whether variance was more likely to have been caused by inter-student aptitude differences or course structure differences. Student confidence in their pharmacy calculations skills and course structure preferences was surveyed. **Results:** Overall student performance was improved when pharmaceutical calculations was taught as a standalone course ( $88 \pm 7$ ) versus calculations combined into a pharmaceuticals course ( $82 \pm 6$ ). Retention of calculation skills improved from  $40 \pm 15$  to  $48 \pm 16$ . OSCE performance was also increased from  $75 \pm 20$  to  $85 \pm 17$  percent. These differences in performance were attributed to change in the course structure as there was no statistically significant difference ( $p=0.074$ ) between the average pre-pharmacy math GPA between the two groups of students. Students also expressed opinions in student confidence response survey that the new course structure was more effective. **Implications:** The standalone course structure and separation was found to be more effective and improved student calculations performance and retention.

**Evaluation of Interventions Made by APPE Students During a Critical Care Rotation.** Dustin D. Linn, *Manchester University*, Rajandeep Kaur, *Manchester University*. **Objectives:** To describe interventions made by student pharmacists in the ICU using the FAST HUG BID mnemonic. **Method:** During an Advanced Pharmacy Practice Experience (APPE) critical care experience students evaluated assigned patients using the FAST HUG BID mnemonic (feeding, analgesia, sedation, thromboembolism prophylaxis, head-of-bed elevation, ulcer prophylaxis, glycemic control, bowel regimen, indwelling lines/invasive catheters, de-escalation) and by looking for IV-to-PO opportunities. Students were educated on the importance of these interventions by reading assigned literature and through discussions with the preceptor. Students used a worksheet to collect data and identify recommendations on a daily basis and potential interventions were discussed with the preceptor. During patient care rounds students made their recommendations to the attending physician and documented the number of patients evaluated and accepted interventions on an Excel document based on the category of intervention. Data was evaluated by totaling the number of patients evaluated, total interventions, and interventions within each category. The study was approved by the Manchester University IRB. **Results:** Students evaluated 458 patients over a 12-week period and made 262 different interventions. The majority of interventions were made in the categories of de-escalation ( $n=57$ ), ulcer prophylaxis ( $n=43$ ), glycemic control ( $n=37$ ), IV-to-PO ( $n=25$ ), and VTE prophylaxis ( $n=23$ ). **Implications:** This study demonstrates that student pharmacists are capable of using a mnemonic to identify interventions in critically ill patients. Use of student pharmacists in an ICU setting may be effective in expanding clinical pharmacy services.

**Evaluation of Student Confidence in Patient Assessment Skills at a Satellite Campus.** Tanya R. Riley, *Wingate University*, Janine S. Douglas, *Wingate University*. **Objectives:** To assess student's perceptions of confidence levels with patient assessment skills in non-standardized patients following traditional didactic instruction at a small satellite campus. **Method:** Students were given a survey prior to instruction in the patient assessment course to establish baseline student perceptions of abilities and confidence. A second survey was performed at the end of didactic training where the only patient assessment interaction was with fellow classmates. After the completion of didactic training, students were randomly assigned non-standardized patient volunteers at a long term care community, and asked to perform

common patient assessment skills. For each non-standardized patient, students assessed blood pressure, heart sounds, breath sounds, pedal pulses, and foot examinations using a monofilament. Upon completion of the experience, students were given a final survey assessing the student's perception of their level of confidence in performing each skill. **Results:** Response results of 19 students noted a 50%, 30%, and 20% increase in confidence levels for the assessment of heart sounds, blood pressure, and pedal pulses, respectively. Survey responses demonstrated a global improvement in student's confidence in assessing evaluated skills. All other evaluated areas reported similar to moderate increases in student confidence. **Implications:** In the absence of simulation resources or use of standardized patients, students are able to improve self-confidence in patient assessment skills with the use of non-standardized patients. In addition to didactic lectures, providing environments where students can apply skills learned in the classroom setting directly to patient care is a useful methodology to help students build self-confidence.

**Evaluation of Student Performance and Satisfaction With Team Based Learning Compared to Traditional Lecture.** Elizabeth Sutton Burke, *St. John Fisher College*, Nabila Ahmed-Sarwar, *St. John Fisher College*, Angela K. Nagel, *St. John Fisher College*. **Objectives:** Determine the impact of course redesign, from traditional lecture format to team based learning (TBL) in a flipped classroom. **Method:** Self-Care and Natural Products is a required course in the second professional year. A novel redesign was implemented moving from traditional lecture format to a format where the amount of time dedicated to topics increased and comprised of both structured student-directed and TBL activities. Pre-class assignments, along with a case based approach, were designed to practice effective communication skills and foster critical thinking. Assessment of student knowledge shifted to individual and team readiness assurance tests along with case-based essay exams. Performance on exams was compared between three cohorts. Additionally, student course evaluations were assessed for both quantitative and qualitative themes between the cohorts. **Results:** Analysis was completed for one cohort of the lecture based format and two cohorts of the TBL format. Overall exam averages ( $\pm$ SD) indicate minimal change between the designs (81.64 $\pm$ 9.6 for lecture format; 84.59 $\pm$ 7.6 and 82.4 $\pm$ 11.2 for the TBL cohorts). Similar trends were seen for course averages (84.75 for lecture format; 87.65 and 85.98 for the TBL cohorts). Course evaluations, completed using a 7-point Likert scale, revealed overall averages of 4.47 for the lecture format with 6.12 and 5.98 for the TBL format. **Implications:** Based on our results, team based learning in a flipped classroom had no negative effect on student performance and greatly improved satisfaction. This course design may allow for development of critical thinking and expansion of knowledge base while improving student engagement.

**Evaluation of Students' Perceptions of Physical Assessment Videos.** Marvin R. Ortiz, *Western University of Health Sciences*, Marie L. Davies, *Western University of Health Sciences*, Divvjyot Singh, *Western University of Health Sciences*, Hyma Gogineni, *Western University of Health Sciences*. **Objectives:** Physical assessment (PA) training was incorporated into our curriculum as part of accreditation standards. PA videos were created to supplement instruction. This study assessed students' perceptions of videos and predictors in improved PA performance. **Method:** This study included P1 students. Student perceptions of the videos on vitals, HEENT (head, eye, ear, neck and throat), cardiac, pulmonary, abdominal, musculoskeletal, and neuromuscular examinations were assessed via a post-course survey utilizing a 4-point Likert scale. PA in the curriculum is assessed via a written exam (WE) and a practicum in the P1 spring semester. Survey

responses were linked to student performance (WE and practicum). Statistical analysis included chi square for categorical data and Student's T-test and linear regression for continuous data. **Results:** Of 106 students, 79% reported they could not have achieved the same performance results without the videos. Over 80% of students agreed/strongly agreed on 10 of 12 survey items assessing increased confidence in PA skills including abdominal, neuromuscular, musculoskeletal, HEENT, and pulmonary exams, obtaining vitals and using cardinal techniques: inspection, auscultation, and palpitation. Students who use PA skills at work or rotations were more likely to score above average on the WE ( $P=0.03$ ). Students who watched the videos  $\geq 2$  times were more likely to score above average on the WE ( $P=0.005$ ). There were no statistically significant predictors for the practicum scores. **Implications:** PA videos were well received by students. Students who watched the videos more and who utilized PA skills outside of the classroom were more likely to score above average on the WE.

**Evaluation of a Contest on Course Performance in an Integrated Critical Care Pharmacotherapeutics Module.** Dustin D. Linn, *Manchester University*. **Objectives:** To evaluate the impact of participation and performance in a course contest during a required critical care integrated pharmacotherapeutics course on examination scores and overall course performance. **Method:** During the critical care portion of a required Pulmonary/Critical Care integrated pharmacotherapy course, students were randomly assigned to teams and participated in a course contest. Students obtained points toward the contest primarily by answering in-class questions utilizing PollEverywhere®. The top individual scorers and members of the top scoring team received from 1 to 5 points added to their exam score. Updated contest team standings were provided regularly. Pearson's Correlation was used to evaluate an association between the percent of in-class questions answered and answered correctly with exam scores and the final course score. Similar comparisons were made for the top half and bottom half of overall course performers based on final course grade. The study was approved by the Manchester University IRB. **Results:** 70 of 74 students answered in-class questions for course competition with a median of 89% of questions answered among all students. A moderate positive correlation existed between the percent of questions answered and the percent of questions answer correctly with the final exam score ( $r=0.378$ ;  $p<0.01$ ) and final overall course score ( $r=0.363$ ;  $p<0.01$ ). Similar positive correlations were noted for exam scores in the top half ( $r=0.368$ ;  $p<0.01$ ) and bottom half ( $r=0.426$ ;  $p<0.01$ ) of course performers. **Implications:** Use of a course contest may be an engaging method of increasing student performance. Strategies to seamlessly incorporate course contests should be evaluated.

**Evaluation of a Newly Established Leadership Development Program for Student Pharmacists.** Bill J. Bowman, *Midwestern University/Glendale*, Erin C. Raney, *Midwestern University/Glendale*, Titilola Afolabi, *Midwestern University/Glendale*, Kelsey Buckley, *Midwestern University/Glendale*, Lindsay E. Davis, *Midwestern University/Glendale*, Rebekah Jackowski, *Midwestern University/Glendale*, Suzanne Larson, *Midwestern University/Glendale*, Joie Rowles, *Midwestern University/Glendale*. **Objectives:** To determine the perceptions of student pharmacists who participated in a newly established leadership development program and report the change in their emotional intelligence scores during the program. **Method:** During 2015-2016, 47 student officers from the College's professional organizations participated in a voluntary leadership development program spanning 6 academic quarters. The program included a variety of self-assessments and large group topic discussions, followed by quarterly individual written reflections with feedback from faculty mentors.

These activities primarily addressed the topics of emotional intelligence, strengths-based leadership, team dysfunctions, and continuous leadership development. The participants' Emotional Intelligence Appraisal® (EIA) scores near the beginning and end of the program were compared. An anonymous online survey of participant perceptions was administered at the end of the program. **Results:** The response rates for the EIA and survey were 100% and 43%, respectively. The mean overall EIA score increased from  $75 \pm 9$  to  $79 \pm 9$  ( $P < 0.05$ ), while the mean self-awareness, self-management, and social awareness subset scores increased from  $74 \pm 11$ ,  $74 \pm 12$ , and  $74 \pm 10$  to  $80 \pm 10$ ,  $79 \pm 10$ , and  $77 \pm 11$ , respectively ( $P < 0.05$ ). All respondents either strongly agreed or agreed that the program enhanced their leadership development, while 85-100% rated each activity as being either very beneficial or beneficial. In addition, 50% of respondents identified the strengths-based leadership activities as being the most beneficial. **Implications:** The inaugural offering of this leadership development program appears to have been well received and may be an effective method for increasing the emotional intelligence of student pharmacists.

**Evaluation of a Social Media Focused Intervention on Reducing Mental Health Stigma Among Pharmacy Students.** Mark Douglass, *Northeastern University*, Benjamin Moy, *Northeastern University*, Erin Dong, *Northeastern University*, Dinh Nguyen, *Northeastern University*. **Objectives:** To determine whether a 90-minute interactive learning module improves pharmacy students' attitudes towards reducing stigma encountered by patients with mental illness. **Method:** To apply introductory coursework on mental health, an educational intervention, which utilized social media and patient case scenarios, was developed and administered to third-year pharmacy students ( $n=145$ ) during small group class sessions. The Opening Minds Stigma Scale for Health Care Providers (OMS-HC), a validated tool to measure stigma, was administered immediately before and after the intervention. Pre/post OMS-HC scores were analyzed using a paired t-test. **Results:** Among the 145 students who participated in the intervention, 89.0% ( $n=129$ ) and 79.3% ( $n=115$ ) completed the pre-survey and post-survey, respectively. Compared to pre-test survey responses, stigma significantly decreased by 17.7% from 37.1 (35.9 to 38.2) to 35.0 (33.9 to 36.1),  $p < 0.05$ . A sub-group analysis of the six questions related to attitudes toward people with mental illness also showed a significant reduction in stigma by 6.7% from 13.5 (12.8 to 14.1) to 12.6 (12.0 to 13.2),  $p < 0.05$ . **Implications:** Educational interventions that utilize social media applications, which are more relatable to current generation pharmacy students, can reduce negative attitudes associated with mental health stigma, and potentially improve the treatment of patients with mental disorders.

**Evaluation of a Voluntary School of Pharmacy Mentoring Program.** Stephen R. Hill, *The University of Louisiana at Monroe*, Kristen A. Pate, *The University of Louisiana at Monroe*, Jessica H. Brady, *The University of Louisiana at Monroe*, Kelsey Dearman, *The University of Louisiana at Monroe*, Stephanie Barre, *The University of Louisiana at Monroe*. **Objectives:** To evaluate a school of pharmacy's voluntary mentor program from the students' and faculty members' perspective and identify opportunities for improvement. **Method:** Two electronic surveys, one faculty and one student, were developed to assess participation in the mentor program. Data regarding demographic information, program satisfaction (1=unsatisfied/no benefit and 5=completely satisfied/extremely beneficial), motivation for participation, and suggestions for improvement were collected. The IRB-approved surveys were emailed to faculty members and all students enrolled in the professional program for at least one year. Results were

reported using descriptive statistics. **Results:** Of the 20 faculty members completing the survey, 15 currently participate in the mentor program. The most common reasons cited for participation include: getting to know students on a more personal level and help with students' career development (86.7%). Of the 89 student responses, approximately half currently participate in the voluntary program. Of those students who do not participate, the most common reasons cited were lack of knowledge about the program and not enough time to commit. Overall satisfaction with the program averaged 3.5 and 4.4 for faculty and students, respectively. Regarding perceived benefit of the program to students' academic and career success, faculty responses averaged 3.6 and students' 4.3. **Implications:** This evaluation of our mentor program, including student and faculty comments, will be used to enhance our current program. The changes made to improve our program can be used to reinforce all Key Elements of Standard 4 as detailed in ACPE Standards 2016.

**Evaluation of an Interprofessional Medication Error Prevention Workshop on Healthcare Student Perceptions.** Mary M. Bridgeman, *Rutgers, The State University of New Jersey*, Mark T. Rusay, *Rutgers, The State University of New Jersey*, Marcus G. Sturgill, *Rutgers, The State University of New Jersey*. **Objectives:** To identify the impact of an interprofessional medication error prevention workshop on student attitudes toward delivery of team-based patient care in prevention of medication errors. **Method:** Pharmacy, medical, and physician assistant students' attitudes prior to and after participating in a large-scale three-hour medication error prevention workshop were captured utilizing the validated Attitudes Towards Health Care Teams survey instrument. The primary outcome, the difference in attitudes among various health professions students, was captured in pre- and post-workshop evaluations. **Results:** Pharmacy and physician assistant student attitudes toward interprofessional patient care tended to improve, whereas medical students tended to be the least receptive towards interprofessional patient care, both before and after workshop participation. Two questions, in particular, showed an increase in pharmacy and physician assistant students' attitudes. For the question, "Working on a team keeps most health professionals enthusiastic and interested in their jobs", student pharmacists agreed more strongly than either medical or physician assistant students prior to the workshop [respective median (IQR) responses of 4 (3, 4), 3 (2, 4), and 3 (2, 4)], whereas physician assistant students agreed more strongly after workshop participation [4 (4, 5), 3 (2, 4) and 4 (3, 4) for pharmacy, medical, and physician assistant students, respectively]. Similar changes regarding interprofessional patient care were observed in an additional survey item ("Developing a patient care plan with other team members avoids errors in delivering care"). **Implications:** This study demonstrated a positive impact of an interprofessional medication errors prevention workshop on influencing the attitudes of the participating healthcare students.

**Evaluation of an Introduction to Academic Teaching Course for Third-Year Doctor of Pharmacy Students.** Andrea L. Porter, *University of Wisconsin-Madison*, Susanne G. Barnett, *University of Wisconsin-Madison*, Casey Gallimore, *University of Wisconsin-Madison*, Karen Kopacek, *University of Wisconsin-Madison*, Michael E. Pitterle, *University of Wisconsin-Madison*, Amanda Margolis, *University of Wisconsin-Madison*. **Objectives:** To evaluate an introduction to academic teaching course for third-year Doctor of Pharmacy students. **Method:** An elective 2-credit course was designed and implemented in fall 2009 to introduce students to academia. One credit includes participating in and leading weekly discussions related to academia and teaching. The other credit is comprised of a semester-long



teaching project with a faculty mentor. At the end of the 2016 fall semester, a course evaluation consisting of a focus group with course faculty was held to discuss course strengths and areas for improvement based on student feedback. **Results:** A total of 49 students have taken the course over 8 semesters, of which 34 have since graduated. Five faculty members were present for the focus group. Perceived course strengths included positive student feedback regarding the course discussions and an introduction to academia. Faculty also voiced mutual benefit from course projects. Areas for improvement included increased faculty feedback on student performance, structured exposure to grading, course administration, and formal teaching opportunities for students, and more intentional faculty presence at weekly discussions based on topic. **Implications:** An elective academic teaching course was positively received by pharmacy students and course faculty. Future directions include systematically evaluating the impact of the course on past students' teaching interest and responsibilities. A similar course could be implemented at other pharmacy schools to introduce students to academia and encourage them to become future educators.

**Exam Wrappers: Metacognitive Approach to Exam Review.** Gina J. Ryan, *Mercer University*, Jill M. Augustine, *Mercer University*, C. Lea Bonner, *Mercer University*, Kristen A. O'Brien, *Mercer University*. **Objectives:** To determine pharmacy students' attitudes about using exam wrappers and to determine if they were effective in improving students course grades. **Method:** An exam wrapper is a written exercise where students reflect on their performance after receiving an exam grade. Shortly before the next exam, students are emailed their reflections in order to prepare for the next test. Students completed an online questionnaire about their test preparation, why they missed points, and what they will do the next time (exam wrapper process). Students completed 5 exam wrappers during one course in a semester, covering topics in law, top 200 drugs, and calculations. **Results:** Students (n=124, 81.6%) completed the exam wrappers and perception survey. Only 39% of students (n=54) agreed that the exam wrapper process was helpful. There was no difference in average course grade of students who agreed the exam wrappers were helpful compared with those students who did not find exam wrappers helpful (84.6% versus 84.0%, P=0.09). Additionally, there were no significant differences in course grade between students who agreed they could implement changes in study techniques and those who could not implement changes (84.3% vs 84.0%, respectively P=0.35). Many students commented that they lacked time in using the exam wrapper process when studying for their exams. **Implications:** Many students found the exam wrappers helpful but struggled to implement changes in study techniques. Further analysis is warranted to understand why exam wrappers did not work in this population, when other metacognitive processes have been effective.

**Examining Relationships Between Pharmacy Students' Myers – Briggs Type Indicators and Pharmacy Curriculum Outcomes Assessment Scores.** Kenric B. Ware, *South University*, Richard O'Brocta, *South University*. **Objectives:** To determine if statistical differences existed in performances on the Pharmacy Curriculum Outcomes Assessment (PCOA) relative to Myers – Briggs Type Indicators (MBTIs). It was hypothesized that statistical differences among PCOA scores would occur based upon MBTIs. **Method:** This was a retrospective study using data from pharmacy students on the distance and main campus of a school of pharmacy within their third professional year. MBTI groupings consisted of extroversion – introversion (E-I), sensing – intuition (S-N), thinking – feeling (T-F), and judging – perception (J-P). These pairings, excluding J-P, and corresponding PCOA scores,

were examined by independent t – tests. J-P designations were not analyzed statistically due to disproportionate results. Statistical significance of  $p < 0.05$  was determined a priori. **Results:** Data from 56 (63% female) and 83 (69% female) students on the distance and main campuses were analyzed. Each campus, along with combined data, yielded p values corresponding to differences in PCOA scores of 0.41, 0.57, and 0.78 (distance); 0.04, 0.09, 0.45 (main); 0.03, 0.21, 0.54 (both campuses). 95% and 90% of students (distance and main campuses) received "J" designations. Acceptance of the study hypothesis was related to E-I categories from the main campus and combination of both campuses ( $p = 0.04$ ,  $p = 0.03$ ). **Implications:** Personality types may account for tendencies brought into examination sessions. Awareness of this may assist faculty members in student advising responsibilities. Data suggesting one personality type may perform better on standardized assessments than another may be incorporated into conversations about success on licensure examinations.

**Facilitation of Distance-Pathway Pharmacotherapeutic Case Studies Using Technology.** Amy Pick, *Creighton University*, William R. Hamilton, *Creighton University*, Nicole D. White, *Creighton University*, Alynne R. Wize, *Creighton University*. **Objectives:** Describe the use of technology in the implementation of synchronous distance Pharmacotherapeutic case studies. **Method:** Weekly synchronous case studies are a component of our three-semester Pharmacotherapeutics sequence. Substantial revisions were implemented in Spring 2016, including the incorporation of team-based learning (TBL) to increase student engagement and improve the learning experience. Seventy distance students were assigned to groups of five along with a group facilitator. Students participated in 12 weeks of case study activities during the semester. Ten weeks were two-hour TBL case study sessions. During the first hour of TBL, groups prepared cases using their choice of a video conferencing tool. During the second hour, two TBL groups merged for case presentation and discussion with the facilitator using the web conferencing platform, Cisco WebEx. There were also two weeks of individual cases, which were one-hour in length. In this time, students processed a case, prepared a case monitoring card and recorded themselves presenting the case using Skype for Business. **Results:** A survey was conducted May 2016 to evaluate student perceptions of the new format. The results were overwhelmingly positive. Eighty-two percent of students strongly agreed that teamwork should continue in case studies. Eighty percent felt the individual case study allowed them to demonstrate their own abilities. The majority of students reported the technology was straightforward, with limited issues during the semester. **Implications:** Various technology platforms may be utilized to facilitate synchronous case study activities for distance-pathway students in a Pharmacotherapeutics course.

**Faculty Objectivity When Grading Student Collaborators.** Kathryn A. Mueller, *East Tennessee State University*, Samuel C. Karpen, *East Tennessee State University*. **Objectives:** To determine whether faculty assign different grades to students with whom they collaborate than to students with whom they do not collaborate. **Method:** Guided by a research mentor, students completed a capstone research project during their P4 year. When students presented their findings, they were graded by both their research mentor and a panel of faculty who did not mentor them (non-mentors). We explored a dataset containing mentors' and non-mentors' capstone research presentation grades to determine whether mentors and non-mentors graded differently. **Results:** Mentors (M=92.3%) assigned higher presentation grades than non-mentors (M=90.2%) overall, and on the following presentation subsections: slides (91.8% vs. 88.2%), title (97.3% vs.

93.1%), background (93.6% vs. 90.8%), literature review (92.8% vs. 89.7%) and conclusion (93.6% vs. 90.7%). All mentor-grader comparisons used a dependent samples t-test with alpha set at .05, and all were significantly different. There was a significant interaction between mentor vs. non-mentor grades and mentors' relationship ratings, such that mentors only assigned higher grades than non-mentors when they had a good working relationship with the presenter. Mentors' and non-mentors' clinical seminar grades did not differ when mentors rated the working relationship less favorably  $F(1,185)=6.66, p=.011$ . **Implications:** We found that mentors assigned higher grades to presenters than did non-mentors, and that this discrepancy more pronounced when mentors rated their working relationship with the presenter favorably. Our research questions whether faculty can objectively grade students with whom they collaborate.

**Fall Semester Pharmacotherapy Capstone Presentation: Building a Patient Case With a Comorbidity.** Marina Suzuki, *Pacific University Oregon*, Pauline Low, *Pacific University Oregon*, Danielle Backus, *Pacific University Oregon*, Anita J. Cleven, *Pacific University Oregon*, Brandon Nuziale, *Pacific University Oregon*, Brendan Stamper, *Pacific University Oregon*, Madeline Fry, *Pacific University Oregon*, Kristine Marcus, *Pacific University Oregon*, John E. Begert, *Pacific University Oregon*, John Harrelson, *Pacific University Oregon*, Deepa Rao, *Pacific University Oregon*, David Fuentes, *Pacific University Oregon*. **Objectives:** This project aimed to evaluate student and faculty perspectives on incorporating a student-created patient case presentation synthesizing concepts presented in  $\geq 2$  pharmacotherapy courses within an accelerated, competency-based, modified-block curriculum. **Method:** Sixteen groups of 6-7 students developed a 30-minute patient case presentation as a semester capstone. The patient's primary problem was selected from the current course, and comorbid conditions were chosen from previous pharmacotherapeutic courses. A template was provided to guide students through components of case presentations and to stimulate creative thinking of patient-related factors. Pre- and post-presentation surveys of students and faculty evaluation were conducted with Qualtrics. **Results:** Sixty-eight students completed both pre- and post-presentation surveys. On a scale of 0 (=disagree) to 10 (=agree), students' ratings to the statement, "I know how to present a patient case," were  $6.1 \pm 2.5$  before and  $7.9 \pm 1.6$  after the project ( $p < 0.001$ ; mean  $\pm$  SD). Students responded that synthesizing a previously learned topic with a topic they were currently learning was modestly difficult,  $6.4 \pm 1.9$  on a scale of 0 (=not challenging) to 10 (=challenging). Three (19%) of 16 groups received a grade from faculty members indicating that the topics were not adequately synthesized whereas all other groups sufficiently blended their information. Seventy-six students responded to the post-presentation survey; all 76 responses indicated the template was helpful as a guide. **Implications:** Students improved their confidence in synthesizing and presenting a patient case through this project. Providing a template was helpful to facilitate their learning.

**Field of Dreams: Faculty Teaching Development in 5 Minutes.** Ashley Castleberry, *University of Arkansas for Medical Sciences*, Seena L. Haines, *The University of Mississippi*, Susan M. Stein, *Pacific University Oregon*, Jenny A. Van Amburgh, *Northeastern University*, Schwanda K. Flowers, *University of Arkansas for Medical Sciences*, Adam M. Persky, *University of North Carolina at Chapel Hill*. **Objectives:** A series of monthly 5-minute teaching sessions were created to provide training to faculty with limited time for development in teaching. **Method:** Health professions faculty from 5 institutions engaged in monthly sessions for 1 year. The 5-minute presentation was intended to capture interest and motivate faculty to further research the teaching topic

using the provided supplemental handout. To collect perceptions using this faculty development method, faculty completed a pre-, mid-, and post-program survey to monitor development. **Results:** Faculty indicated that their greatest barrier to gaining development in teaching is time (54%). Self-assessment of teaching skills increased for 9 of the 12 topics after participating in the sessions. Half of the responses indicated that the timely and informative nature of the sessions was the best feature of this method. Anticipated changes to teaching and learning instructional design included incorporating active learning (35%) and improving teaching materials (21%). **Implications:** The 5-minute sessions were the preferred method of receiving faculty development in teaching. Possible reasons include the diverse roles and responsibilities of faculty and necessity to gain quality development in short periods of time. The 5-minute model can be easily adapted to fit the development needs of faculty at any school/college of pharmacy.

**Five 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 evaluate residents' self-assessment of their teaching in an elective course compared with students' and course faculty's perception of their teaching over a five 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. Descriptive statistics were used to evaluate survey results and Mann-Whitney U tests were used to compare faculty, resident, and students' evaluations of resident teaching. **Results:** All residents ( $n=58$ ) from the past five years completed the surveys. Overall evaluations of teaching by residents and faculty had a median score of 4 (meets expectations). No differences were observed between the residents' overall self-evaluation scores and the faculty evaluations of resident's teaching ( $p=0.33$ ). Students scored residents higher than residents scored themselves ( $p < 0.05$ ) and higher than faculty scored residents ( $p < 0.05$ ). Residents strongly agreed that faculty feedback was constructive and advanced preparation was helpful, specifically with generating objectives and a lesson plan. **Implications:** During a five 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.

**Flipped Classroom Versus a Didactic Method With Active Learning in a Team-Based Learning Course Format.** Jennifer A. Wilson, *Wingate University*, Rashi C. Waghel, *Wingate University*, Melissa M. Dinkins, *Wingate University*. **Objectives:** To compare the flipped classroom method versus a traditional didactic method with active learning in a team-based learning (TBL) course format. **Method:** Grade performance on readiness assurance processes, both individual (iRAP) and team (tRAP), along with exam questions were compared for enrollees in Self-Care Pharmacotherapy. Additionally, students were surveyed upon course initiation and conclusion to ascertain perceptions of the methods. Descriptive statistics were utilized for demographics and perceptions; paired t-tests were used to compare assessment performance. **Results:** No statistically significant differences existed between methods for performance on assessments. The

mean iRAP and tRAP scores, respectively, were 84.6% and 96.4% for the traditional method and 86.2% and 96.0% for the flipped method ( $p=0.13$  and  $p=0.64$ ). Mean exam performance for content taught using the traditional and flipped methods were 83.3% and 84.3% respectively. Ninety-seven initial questionnaires were completed (93.3% response rate). Approximately 30% of respondents indicated an initial preference for the traditional method, 9% for flipped, and 59% for a combination. Sixty-six questionnaires were completed at semester conclusion (63.5% response rate). Approximately 48% indicated a final preference for the traditional method, 8% for flipped, and 45% for a combination. Respondents indicated the traditional method helped develop deeper content understanding, stimulated greater interest in content, and improved retention for assessments; however, the flipped method improved the ability to critically think and apply content. **Implications:** Since there were no significant differences in performance on assessments between methods, it may be beneficial to use a combination of teaching methods to appeal to different learners and achieve various outcomes.

#### **Gait Training and Medications Impacting Safe Ambulation: Peer-to-Peer Teaching of Pharmacy and Physical Therapy Students.**

Melissa M. Chesson, *Mercer University*, Niamh Tunney, *Mercer University*, Gina J. Ryan, *Mercer University*. **Objectives:** To evaluate a teaching activity between pharmacy students and physical therapy (PT) students which focused on gait training using assistive devices and the review of medications impacting safe ambulation. **Method:** An activity was designed to meet interprofessional and individual course outcomes. During the activity, PT students instructed pharmacy students in the accurate fit and counseling for canes, crutches, and walkers. Pharmacy students then demonstrated these skills and instructed PT students about medications that impact safe ambulation and gait training. Students completed a 15-item pre- and post-knowledge assessment and a perceptions survey. Descriptive statistics were used to evaluate survey results and paired t-tests were used to compare assessment scores. **Results:** Pharmacy students ( $N=126$ ) and PT students ( $N=31$ ) completed the assignment. Pharmacy students' and PT students' assessment scores improved by 13% and 11%, respectively, after activity completion ( $p<0.05$  for both). Students strongly agreed that the activity provided an opportunity to gain a greater understanding of the roles and responsibilities of the physical therapist and pharmacist regarding assistive devices and that it promoted communication and collaboration between disciplines. Physical therapy students strongly agreed that the activity developed competence in assistive device education and increased their recognition of medications affecting safe ambulation. Pharmacy students strongly agreed the activity developed competence in assistive device training and counseling. **Implications:** Pharmacy students and PT students can effectively learn about assistive devices and medications impacting safe ambulation through an interprofessional peer-peer teaching activity. Peer teaching across disciplines can help prepare students to communicate and collaborate with other healthcare providers.

#### **Gauging Development During a Teaching Certificate Program: Qualitative Analysis of Reflective Exercise Submissions.**

Jessica Reid, *University of Arkansas for Medical Sciences*, Amy M. Franks, *University of Arkansas for Medical Sciences*. **Objectives:** To characterize self-reported teaching-related successes and challenges midway through a longitudinal teaching certificate program (TCP). **Method:** Participants from 3 program years were prompted to identify 3 successes and 3 challenges related to teaching activities encountered during the first half of the TCP. Brief descriptions were submitted as part of a guided reflection exercise during the group seminar. Responses

were de-identified and a thematic qualitative analysis was conducted using a constant comparative approach by 2 independent coders. **Results:** Teaching successes ( $n=243$ ) and challenges ( $n=255$ ) were submitted by 87 participants. Common themes emerged for both teaching successes ( $n=15$ ) and teaching challenges ( $n=17$ ). The most frequently identified themes for participants' teaching successes were the delivery of a specific teaching activity (23%), using distinct teaching methods/style (18%), giving feedback (11%), and fostering an effective learning environment (9%). The most frequently identified themes for participants' teaching challenges were inadequate preparation (17%), utilizing distinct teaching methods/style (14%), ineffective presentation skills (13%), and giving feedback (11%). **Implications:** During the 3 program years, participants shared similar self-reported teaching-related successes and challenges. Some themes, such as using a distinct teaching method/style and giving feedback, emerged as both successes and challenges repeatedly submitted by participants. Implementation and subsequent qualitative analysis of this reflective exercise encourages participant awareness of skill development and provides a rich resource for further programmatic quality improvement.

#### **Healthcare Student Attitudes Following Simulation-Based Interprofessional Education.**

Julia S. Stevens, *Purdue University College of Pharmacy*, Sophie Shi, *Purdue University School of Nursing*, Karen S Yehle, *Purdue University School of Nursing*, Kimberly S. Plake, *Purdue University College of Pharmacy*. **Objectives:** Recent accreditation standards require interprofessional education (IPE) in the curriculum, but the impact of IPE on health profession student attitudes remains uncertain. The objective of this study was to identify students' perceptions of interprofessional teamwork and patient care from a simulated IPE experience. **Method:** Pharmacy, nursing, and dietetics students participated in a simulation utilizing standardized patients (professional actors) with the intent of enhancing students' regard for interprofessional teamwork and ability to communicate with patients. Students worked in interprofessional teams to comprehensively assess and care for standardized diabetic and hospice patients. Subsequently, students wrote reflections describing their attitudes toward interprofessional teamwork and incorporating patients' health beliefs in patient care. Inductive analysis by two independent researchers identified theme frequency among the written reflections. A theme was significant if greater than 25% of students reflected on it. **Results:** Among 152 pharmacy students, 70 nursing students, and 34 dietetics students, most students (52%) wrote that working as an interprofessional team allowed members to utilize their individual strengths to provide high quality patient care. Students enjoyed the experience (36%), calling it "enlightening and rewarding." Interacting with the standardized patients caused students to reflect on the need for insightful patient education, lifestyle modification, and the role of motivational interviewing in providing care (30%, 27%, and 30%, respectively). **Implications:** This simulation-based approach for interprofessional education led students to value working in interprofessional teams. Therefore, this work supports further implementation of IPE in health profession curricula to prepare graduates for an increasingly team-based healthcare system.

#### **High Alert Medications: An Inter-Professional Simulation Experience.**

Nicole Slater, *Auburn University*, Elizabeth VandeWaa, *University of South Alabama*, Katherine Bydalek, *University of South Alabama*, Erin McAdams, *University of South Alabama*, David Walker, *University of South Alabama*. **Objectives:** 1. Recognize the roles of Pharmacy, Physician Assistants, and Nurses in helping patients with reconciliation of high alert medications. 2. Evaluate

interdisciplinary collaboration and teamwork in patient care **Method:** Students from Pharmacy, Nursing, and Physician Assistant programs took a pre-test on high risk medications and on their impressions of working in medical teams. They then watched a video describing high alert medications, medical team collaboration, and how this collaboration provides advantages to ensure safe medication administration and delivery. Students worked in teams through a variety of simulation experiences using standardized patients and evaluated the issues with medication use, interactions, prescribing, and administration errors. A post-test was administered and a debriefing session was held to assess their ability to work in teams, measuring their impressions of the simulation and overall interprofessional learning experience. **Results:** In all cases, pharmacy students demonstrated a higher knowledge of high alert medications than nursing and PA students, however certain high alert medication questions improved across all disciplines on the post-test. Pharmacy students felt that their discipline should be responsible for identifying and dosing high alert medications 100% of the time but felt much less confident allowing a PA (52%) or Nurse (23%) to complete those tasks. Interestingly, nursing was less confident in pharmacy identifying (79%) high alert medications but felt they (the nursing students) should be able to complete that 100% of the time. **Implications:** Students became more confident in identifying high alert medications through this simulation and learned about the strengths of other disciplines demonstrating the importance of inter-professional education.

**Hotspotting: An Innovative Interprofessional Education Experience in Value-Driven Healthcare.** Kyle Turner, *The University of Utah*, Timothy Farrell, *The University of Utah*, Sara Hart, *The University of Utah*. **Objectives:** Design and implement a community-based, Interprofessional Student Hotspotting educational program within an academic health sciences center. **Method:** An inter-professional cohort of students representing medicine, social work, pharmacy, public health, and nursing engaged in a six-month, student-led Hotspotting initiative aimed at reducing health care utilization of complex patients. Students received training from the Camden Coalition regarding leadership skills, teaming, working with vulnerable populations, and social determinants of health as well as oversight from an interprofessional team of faculty. After developing a partnership with a local housing authority and utilizing health system data, the team invited two patients to participate. Students worked to identify these patients' health needs and to provide care coordination. Student learning was assessed qualitatively to identify themes via a formal debriefing session following the initiative. **Results:** The following themes emerged from students' responses about the initiative: Students emphasized the value and uniqueness of this learning experience. They identified leading and participating in an interprofessional team, increasing their understanding of social determinants of health, and learning collaboratively from other professions among the most valuable aspects of this experience. Areas of improvement identified included a need for a more detailed understanding of the time commitment required for participation, additional information about curricular "credit" for participation, and a desire for more consistent faculty participation. **Implications:** Students regarded the pilot as a positive and meaningful experience. Their feedback will inform future Hotspotting activities within the and the academic health center. It has broad applicability to similar institutions looking to implement value-driven, community-based interprofessional experiences.

**Hotspotting: Engaging Student Learners to Trailblaze Pathways to Improve Care for Patients.** Demi Rissmiller, *Wilkes University*, Jennifer M. Malinowski, *Wilkes University*. **Objectives:** The objective

of this innovation was to engage student learners from multiple institutions to serve on an inter-professional team and establish processes for identifying high-use health care consumers to apply hotspotting techniques to improve care. **Method:** Design: Quality improvement process designed to engage leaders within inter-professional student teams to collaborate with local health care systems to identify high risk healthcare consumers. Health professions students from 5 different health professions schools and two counties were recruited for the effort. Represented disciplines included pharmacy, social work, physical therapy, nursing and physicians. Processes: Team members applied several different approaches to navigate through the hierarchy of several health systems to acquire patients. Lessons learned and barriers to health care delivery will be discussed. **Results:** Solutions included promoting communication pathways between care managers and emergency room teams and improving patient data access for team members by redirecting attention to work within an Accountable Care Organization. Sustainability of the program will be promoted through additional collaboration with a local primary care organization with supportive infrastructure and electronic health record access for students. **Implications:** Developing a process to provide a mutually beneficial relationship between health professions schools, health care organizations and patients is needed to show value. This experience shares a process that may be replicated at other institutions.

**Impact of APPEs With Supplemental Experiential Summits (SES) on Student Preparedness to Provide Pharmaceutical Care.** Vasudha Gupta, *Roseman University of Health Sciences*, Velliyur Viswesh, *Roseman University of Health Sciences*, Ana L. Hincapie, *University of Cincinnati*. **Objectives:** The objectives were to assess students' perceptions of: 1) preparedness to provide pharmaceutical care before and after participation in Advanced Pharmacy Practice Experiences (APPEs) with supplemental experiential summits (SES); and 2) the value of SES in preparing students to provide pharmaceutical care. **Method:** In addition to APPE rotations, students participated in regular didactic sessions called SES, which entailed three content areas, namely therapeutic topic discussion led by faculty, SOAP note presentations, and PowerPoint-based topic presentations. A pre- and post-survey design was implemented to measure students' perceptions of preparedness on each of the three content areas of the SES. For the class of 2015, the pre-survey was administered prior to the 1st APPE block and post-survey was administered upon conclusion of their last APPE block. The post-survey included additional questions assessing students' perceptions of the value of the SES. Descriptive statistics were used for demographics and the Wilcoxon signed rank to compare pre- and post-surveys. **Results:** Of 95 students, 70 (74%) completed both surveys and were included in the analysis. Majority were Asian (61%) and female (58%) with mean age 28.5 years. Of 26 questions on the surveys, 21 showed statistically significant improvements in students' perceived preparedness to provide pharmaceutical care. The most marked improvements were students' perceived ability to complete SOAP notes and PowerPoint presentations. Students also had an overall positive experience finding SES valuable in preparing them for pharmaceutical care. **Implications:** SES represent a viable method of enhancing students' perceptions of preparedness to provide pharmaceutical care.

**Impact of Curricular Reform on a Pharmacy Course in Nonprescription Products.** Melanie M. Dicks, *University of Kentucky*. **Objectives:** 1) Evaluate the effectiveness of innovative, active-learning teaching methods used to teach nonprescription products content in a new pharmacy curriculum 2) Evaluate student satisfaction of

innovative, active-learning teaching methods used to teach nonprescription products content in a new pharmacy curriculum **Method:** Two pharmacy courses in nonprescription products were offered to first-year pharmacy students at the University of Kentucky College of Pharmacy. In the former curriculum, the nonprescription products content was taught using traditional methods of instruction, including lecturing and Problem-Based Learning. In the reformed curriculum, the content was taught using innovative teaching approaches, such as gamification and the use of eBooks and widgets, to reinforce concepts learned. Parallel sets of nonprescription products' assessment items were used for evaluation in both the former and reformed curriculums. The results of these assessment items were analyzed and compared to determine if there was a difference in nonprescription content knowledge between the classes of students assessed. **Results:** From six sets, 23/43 (53.5%) assessment items in the former curriculum vs. 15/43 (34.9%) assessment items in the reformed curriculum were answered correctly. Five out of 43 (11.6%) assessment items were answered correctly at the same rate between both curriculums. Course evaluation scores increased overall in most survey categories. **Implications:** Using innovative teaching methods, such as gamification and use of eBooks and widgets, in a reformed curriculum to teach a pharmacy course in nonprescription products may not significantly improve student assessment scores overall; however, students may perceive enhanced learning using such new approaches over traditional ones.

**Impact of Skills Laboratory Activities on Sterile Compounding OSCE Station Performance.** Amber M. Hutchison, *Auburn University*, Ashleigh Lancaster, *Auburn University*, Erika L. Kleppinger, *Auburn University*, Phillip Lee, *Belmont University*, Gordon Sacks, *Auburn University*. **Objectives:** To evaluate the impact of skills laboratory activities on student pharmacist performance on a sterile compounding Objective Structured Clinical Exam (OSCE) station. **Method:** Sterile compounding is taught over two 2-hour skills laboratory sessions in the second professional year fall semester. Sterile compounding skills are evaluated during a 10 minute OSCE station requiring calculation of intravenous dosage, compounding of a sterile product, and compounded product final verification. A seven part rubric with a three-point scale is used for grading. In the fall of 2014, the laboratory sessions were modified to include formative peer feedback using the grading rubric. Additionally, more product verification practice was added. OSCE rubric data was collected from 2012 through 2017. Statistical analysis was done with SPSS using a t-test for continuous data, Chi-square test for nominal data, and Mann-Whitney U for ordinal data. **Results:** Performance for 705 students was reviewed. The final grades for the OSCE stations were 88.0% $\pm$ 11.7 and 90.7% $\pm$ 9.6 before and after the implemented changes, respectively ( $p=0.017$ ). Prior to the changes, 19 students required remediation compared to 4 students after ( $p<0.05$ ). Manipulation of materials improved from 70.3% to 80.8% of students earning full points before and after the changes, respectively ( $p=0.001$ ). Working in airflow improved from 53.7% to 66.5% of students earning full points before and after the changes, respectively ( $p=0.001$ ). **Implications:** OSCE station performance improved after formative peer feedback was incorporated in the course. Fewer students required remediation after the changes. Peer provided formative feedback may be a useful tool to improve student performance.

**Impact of a Competition Using Sports-Based Models on Performance in Therapeutics Courses.** Brooke Moorhead, *University of Cincinnati*, Patricia R. Wagle, *University of Cincinnati*, Nicholas Messinger, *University of Cincinnati*, Bradley E. Hein, *University of Cincinnati*, Dylan M. Barth, *University of Cincinnati*, Christopher

W. Bresler, *University of Cincinnati*. **Objectives:** The objective of this study was to determine the correlation between participation in non-punitive review assessments and overall course performance in two therapeutics courses. **Method:** In year one, a sports-based model for competition was employed to encourage student participation in weekly review quizzes. Weeks 1-10 of the semester were modeled after an NFL season and weeks 11-15 were modeled after NCAA March Madness. Individual quiz performance resulted in team scores for the competition. In year two, the NFL season model was retained and review quizzes were merged into six review exams. Overall, course performance was compared for participating and non-participating students. **Results:** Most students, 95% and 78% of PY2 and PY3 students, respectively, participated in year one. Participating students had an average course grade 6% or 4.5% (PY2 and PY3 students, respectively) higher than non-participating students. Participation was lower in year two. However, 80% and 42% of PY2 and PY3 students, respectively, participated in a competition team. Participating PY2 and PY3 students had an average course grade 2% higher than non-participating students. **Implications:** Completion of the assessments is associated with higher therapeutics course grades and the results favor a review quiz style. Although PY2 students perceived the review assessments as more helpful compared to the PY3 students, both classes advised review assessment continuation. Common reasons for decreased PY3 participation in year two were lack of time, perceived benefit, and motivation.

**Impact of a Flipped Classroom Approach on Exam Performance in a Required Pharmacotherapeutics Course.** Laura H. Waite, *University of the Sciences*, Jean M. Scholtz, *University of the Sciences*. **Objectives:** To compare student exam performance in a required pharmacotherapeutics course utilizing flipped classroom versus standard content delivery. **Method:** Our pharmacotherapeutics course sequence primarily involves didactic lectures with assigned pre-class textbook readings. Starting spring 2014, the chronic kidney disease (CKD) module was delivered via a flipped classroom approach. Prior to class, the instructor provided relevant readings and recorded six brief videos summarizing key module content. Students selected their preferred pre-class preparation method (i.e. readings, videos, both, or neither). The lecture time consisted of an interactive, progressive patient case utilizing a handout with guided questions. All pre-class preparation material remained available for exam preparation along with recorded class sessions. **Results:** Performance on CKD exam questions was compared to performance on exam questions involving a related disease state (acute kidney injury; AKI) taught using didactic lectures. Overall, students answered a higher percentage of CKD questions correctly than AKI questions ( $n=369$ ,  $p<0.0001$ ). Students also demonstrated better performance when utilizing class preparation methods unique to the flipped content module ( $n=169$ ,  $p<0.0001$ ) and using the totality of the flipped classroom approach (pre-class videos and recorded in-class patient case) for exam preparation ( $n=180$ ;  $p<0.0001$ ). There was no difference in exam performance for students who did not prepare for class or who used only pre-class materials to prepare for the exam. **Implications:** These results demonstrate the effectiveness of the flipped classroom method in improving student exam performance. This data will assist with future curricular changes.

**Impact of a Redesigned IPPE Course on Student Pharmacist Confidence and Performance With IPPE Skills.** Karleen Melody, *University of the Sciences*, Daniel J. Ventricelli, *University of the Sciences*, Henry Schwartz, *University of the Sciences*. **Objectives:** To evaluate the impact a redesigned introductory pharmacy practice experience

(IPPE) course for first professional year student pharmacists (P1) on student pharmacist confidence and performance with IPPE skills. **Method:** A course survey administered on the last day of class contained a retrospective pretest and posttest assessment to evaluate students' self-perceived confidence with IPPE skills. Self-perceived confidence was measured using a 5-point Likert Scale. Grades of the final course competency-based assessment were also analyzed to evaluate the student's performance of selected IPPE skills. **Results:** A total of 153 students out of 155 students completed the course evaluation. Students reported feeling more confident on all nine skill based survey items following the completion of this course ( $p < 0.001$ ). Student self-confidence in using the QuEST SCHOLAR method for a self-care triage, demonstrating devices, and obtaining a medication history had the greatest overall increases. On the final competency-based assessment, 133 of the 155 students (86%) were successful in obtaining a passing score on their first attempt with (99%) obtaining a passing score by their second attempt. **Implications:** This course redesign provided activities that introduced, reinforced, and assessed IPPE skills, which significantly increased students' confidence in their ability to perform those skills. These skills aim to better prepare students to be successful on their community IPPEs and may improve preceptor satisfaction with student performance.

#### **Impact of a Simulated Antimicrobial Stewardship Communication Activity on Pharmacy Students' Knowledge and Confidence.**

Saira Chaudhry, *Rutgers, The State University of New Jersey*, Lindsay A. Brust-Sisti, *Rutgers, The State University of New Jersey*, Rachael Durie, *Rutgers, The State University of New Jersey*, Patricia Greenberg, *Jersey Shore University Medical Center*, Rupal Mansukhani, *Rutgers, The State University of New Jersey*, Lucio Volino, *Rutgers, The State University of New Jersey*. **Objectives:** To determine if students' antimicrobial stewardship (AMS) skills and perceived confidence improve after receiving simulation versus didactic-based education. **Method:** Third professional year students in the required Pharmacy Communications course reported to one of two classrooms (control group or intervention group). All students were given a 9-question pre-quiz. Students in the control group were provided a recorded 60-minute lecture on basic skills needed for AMS programs. Students in the intervention group received the same-recorded lecture with small-group simulation cases at specific time points throughout the lecture. After the lecture, both groups were given an identical post-quiz and survey. The survey collected baseline demographics, self-perceptions regarding teaching methods, and self-reported confidence in case evaluation skills for AMS. **Results:** A total of 205 students completed the pre- and post-quiz, and follow-up survey. The mean change in the quiz scores was  $1.7 \pm 1.8$  in the intervention group versus  $1.2 \pm 1.4$  in the control group ( $p < 0.04$ ). After the activity, more students in the intervention group felt more confident in their ability to evaluate AMS-related cases compared to the control group (19.4% vs. 9.8%,  $p < 0.001$ ). The intervention group also felt that the simulation teaching strategy was more helpful in their learning (32% vs. 1.8%,  $p < 0.001$ ) and found the activity more satisfying (30.1% vs. 13.7%,  $p < 0.001$ ). **Implications:** This study found that AMS simulation learning was more helpful and improved students' confidence in AMS knowledge and skills. This study suggests that AMS simulation learning can be a feasible teaching method.

#### **Impact of an Interprofessional Education Game on Health Professional Students' Readiness for Interprofessional Learning.**

Allison M. Hester, *Purdue University*, Hillary A. McNamee, *Purdue University*, Karen S. Yehle, *Purdue University School of Nursing*, Kimberly S. Plake, *Purdue University*. **Objectives:** To describe the

impact of an interprofessional education (IPE) game on health professional students' readiness for interprofessional learning. **Method:** Over the past five years, pharmacy (N=746), nursing (N=411), dietetics (N=364) and medical (N=43) students participated in the Geriatric Medication Game®, which simulates the older patient experience. Students from different disciplines were paired together to navigate the simulated health care system as spouses or siblings. Pre- and post-activity surveys were administered to assess students' readiness for interprofessional learning. The Readiness for Interprofessional Learning Scale, a 19 item instrument with four subscales (shared learning, teamwork and collaboration, professional identity, and roles and responsibilities), was utilized. Students responded using a Likert scale with 1=strongly disagree and 7=strongly agree. Descriptive statistics were performed for all items and subscales. Paired T-tests were conducted to compare student pre and post-activity scores and ANOVA was used to compare scores by discipline. **Results:** Pharmacy and nursing students demonstrated statistically significant improvement in shared learning ( $p=0.008$  and  $p=0.049$ , respectively) and professional identity ( $p=0.044$  and  $p=0.001$ , respectively) after completing the IPE activity. Dietetics students demonstrated statistically significant decrease in teamwork and collaboration ( $p=0.011$ ). There were no statistically significant differences in any of the medical students' subscale scores. When comparing subscale scores across disciplines, there was a statistically significant difference between responses of pharmacy and dietetic students in teamwork and collaboration ( $p=0.001$ ). **Implications:** Students from different health disciplines have different attitudes toward interprofessional learning. Results suggest IPE activities may not have the same effect across health disciplines.

#### **Impact of an Interview Assignment on Student Understanding of Interprofessional Collaboration with Healthcare Professionals.**

Stacey Dull, *Creighton University*, Ann M. Ryan Haddad, *Creighton University*, Michele A. Poepping-Faulkner, *Creighton University*, Yongyue Qi. **Objectives:** To evaluate the ability of an interview assignment completed by first year pharmacy students as a part of their Communication Skills course to improve student understanding of their and other healthcare professionals' roles and responsibilities on the healthcare team, enhance interprofessional communication skills, and develop teamwork abilities. **Method:** A pre- and post-survey were developed using the Core Competencies for Interprofessional Collaborative Practice as a guide. The survey consisted of three sections including roles and responsibilities, interprofessional communication, and teams and teamwork. Each section included four questions which were answered using a 5-point Likert scale. The survey was administered and data extracted using our learning management system, Blue-Line. **Results:** Seventy-five campus students and 69 distance students completed the surveys. The mean age was  $25.9 \pm 6.3$  years, 98 (68.1%) were females, and 92 (63.9%) had previous interprofessional work experience with a healthcare team. The post-survey scores for each section of the survey improved significantly when compared with the pre-survey scores ( $p < 0.001$ ). Of note, students with previous interprofessional work experience scored higher on each section of the survey when compared with students who did not have work experience in an interprofessional setting ( $p < 0.001$ ). **Implications:** With emphasis on integrating interprofessional experiences into the pharmacy curriculum, it can be difficult to develop meaningful, appropriate, and effective activities for first year students. An interview conducted with a healthcare professional outside of pharmacy proved to be beneficial for student learning in regards to understanding roles and responsibilities, communication skills, and teamwork.

**Impact of the Sanford Guide in an Infectious Diseases Series on Student Knowledge and Perceptions.** Kristen A. O'Brien, *Mercer University*, Nicole L. Metzger, *Mercer University*, Nader H. Moniri, *Mercer University*, Samuel K. Peasah, *Mercer University*. **Objectives:** To compare students' infectious diseases (ID) knowledge and perceptions of the course series before and after implementing The Sanford Guide to Antimicrobial Therapy 2015 (Sanford Guide). **Method:** Third year pharmacy students take a two-course ID series each spring. In 2016, course faculty incorporated the Sanford Guide to limit the burden of memorization and improve drug information skills. A closed-book, 55-question survey is administered at the end of the series to assess students' perceptions and general ID knowledge. Survey results for 2015 (control) and 2016 (intervention) were compared using the Chi-square test to assess the impact of the Sanford Guide. **Results:** Significantly more students from 2016 answered that their ID education had prepared them "very well" or "well" to know when to: start antimicrobial therapy (92.2% vs. 83.3%,  $p=0.0382$ ), how to select the best antimicrobial for a specific indication (91.4% vs. 81.4%,  $p=0.0248$ ), how to find reliable sources of information (92.2% vs. 82.4%,  $p=0.0234$ ), and how to handle a patient who demands antimicrobial therapy that is not indicated (70.3% vs. 43.1%,  $p<0.0001$ ). While students scored similarly on the majority of the knowledge-based questions, students from 2016 scored significantly higher on one question dealing with community acquired pneumonia (91.3% vs. 80%,  $p=0.0144$ ) but scored lower on two questions relating to anaerobic coverage (22.2% vs. 38%,  $p=0.0096$ ) and the treatment of *Clostridium difficile* (69.1% vs. 82%,  $p=0.0260$ ). **Implications:** The Sanford Guide improved students' perceptions of the ID course series and resulted in similar performance on knowledge-based questions.

**Impact of the Sanford Guide on Students' Exam Performance in an Infectious Diseases Series.** Nicole L. Metzger, *Mercer University*, Kristen A. O'Brien, *Mercer University*, Nader H. Moniri, *Mercer University*, Samuel K. Peasah, *Mercer University*. **Objectives:** To compare students' performance on exam questions before and after implementing The Sanford Guide to Antimicrobial Therapy 2015 (Sanford Guide). **Method:** Third year pharmacy students take a two-course infectious diseases series each spring. In 2016, course faculty allowed use of the Sanford Guide during lectures, team-based learning, and on all exams. Performance on exam questions was compared between 2015 (control) and 2016 (intervention). Exam questions that were used both years were identified, and the percent correct for each question was compared using the Student's t-test. Regression analysis was performed to identify positive predictors of student performance. **Results:** Students from 2016 performed a mean of 1.7% better on all 235 exam questions ( $p=0.0162$ ) and a mean of 4.9% better on the 69 questions that the Sanford Guide could answer ( $p=0.0001$ ). There was no difference in students' performance on the 76 clinical questions ( $p=0.4104$ ). Students who scored in the bottom 27% on each exam performed a mean of 8.5% better on questions that the Sanford Guide could answer ( $p<0.0001$ ) and a mean of 4.2% higher on all exam questions ( $p=0.0012$ ). Regression analysis suggested that exam scores significantly improved from 2015 to 2016 for both students in the top and bottom 27% and that the author of the question influenced performance. **Implications:** Using the Sanford Guide on exams improved students' overall exam performance but did not significantly improve their performance on clinical questions. Students who performed in the bottom 27% of each exam benefited significantly from use of the Sanford Guide.

**Implementation of a Web-Based System to Improve the Annual Faculty Merit Review Process.** Adam B. Woolley, *Northeastern University*, Michael Conley, *Northeastern University*, Michael Gonyeau,

*Northeastern University*. **Objectives:** Individual tenure and non-tenure track faculty annual merit summary submissions are independently reviewed by the department chair and a faculty elected merit review committee. Submissions have lacked consistency and longitudinal tracking of accomplishments has been difficult. Activity Insights by Digital Measures (DM), a web based system, longitudinally documents faculty activities and provides customizable reports. Our objective was to improve the efficiency of our review process by transitioning to DM to more easily document and track faculty activities and accomplishments in a reportable database. **Method:** Feedback on the merit review process was obtained from faculty. Merit review committee members met with relevant stakeholders to incorporate faculty feedback and departmental needs into a newly developed DM template. Educational materials and reference guides were developed to assist faculty and promote consistent data input. Faculty were required to submit activities via DM for the 2016 evaluation year. **Results:** Our department ( $n=26$ ) was the first within the University to utilize DM for merit review purposes. Most faculty members ( $n=25$ ) successfully submitted information into the new system pertaining to 42 courses and 96 peer-reviewed publications. DM improved the process by pre-populating various fields through integration with University systems. Consistency of faculty input improved, while manual inputs remained challenging. The DM transition was well received within our department. **Implications:** Continued utilization of DM may streamline future merit review processes. Stakeholders can generate reports to identify individual and aggregate accomplishments. This information may be helpful in identifying opportunities for future faculty collaborations, particularly in the areas of scholarship and inter-professional education.

**Implementation of the Pharmacists' Patient Care Process into a Doctor of Pharmacy Curriculum.** Amber Verdell, *West Coast University*, Diem Thai, *West Coast University*, Keri Hurley, *West Coast University*, Mohammed A. Islam, *West Coast University*. **Objectives:** To describe the identification and mapping of courses where the Pharmacists' Patient Care Process (PPCP) is introduced, implemented, and assessed in a Doctor of Pharmacy curriculum. **Method:** We have adopted a two-step process to identify and map courses in the Doctor of Pharmacy curriculum where the PPCP is implemented or assessed. As a first step, the PPCP was introduced to faculty and preceptors, then faculty attended a consensus building and brainstorming session to identify opportunities to implement PPCP. The following semester, the curriculum committee met and identified courses in the curriculum where the PPCP was implemented or assessed. **Results:** Eighty-eight percent of full-time faculty attended either the PPCP introductory presentation or curriculum brainstorming session. Faculty reported consensus with standardizing PPCP terminology and identified courses where the PPCP is implemented. The curriculum committee found the PPCP is taught in the 1st and 2nd year, assessed formatively in the 1st year and 2nd year, and assessed summatively in the 3rd and 4th year. Didactic courses assess PPCP steps Collect, Assess, and Plan; experiential assessments also include the final steps of Implement and Follow-up. Future opportunities for implementation have been identified via standardization of rubrics used across the curriculum. **Implications:** We report our process of introducing PPCP to faculty and preceptors and establishing consensus on implementation of the PPCP in the curriculum. We then mapped implementation and assessment of PPCP in the curriculum. Other pharmacy schools may adapt a similar approach to identify and implement PPCP in the curriculum.

**Implementing STEADI: A Student Interprofessional Education Approach to Fall Prevention.** Christine M. Klein, *Mercer University*, Johnathan W. Hamrick, *Mercer University*, David Taylor, *Mercer University College of Health Professions*, Ruth McCaffrey, *Mercer*

*University Georgia Baptist College of Nursing.* **Objectives:** To describe a pilot interprofessional experience utilizing students from Mercer University Health Sciences Center focused on a community-based fall prevention screening for older adults utilizing the CDC STEADI (Stopping Elderly Accidents, Deaths, & Injuries) Older Adult Fall Prevention initiative. **Method:** Faculty and students representing the Pharmacy, Family Nurse Practitioner, Physical Therapy, Physician Assistant, and Public Health programs participated in the project which consisted of four phases: Preparation, Instruction and Training, Community Fall Risk Screening, and Post Assessment. Phase 1 consisted of student and participant recruitment and equipment procurement. During Phase 2, students were organized into interprofessional fall risk screening assessment teams for training. During Phase 3, student-assessment groups completed fall risk screenings and provided recommendations on fall risk reduction to community-dwelling older adults. During Phase 4, both students and faculty completed separate online surveys of their perceptions of the experience, and students completed a post-test knowledge assessment. **Results:** Analysis indicated that students are able to collaborate effectively to deliver a community-based fall screening program using the STEADI tool. The community participant survey results indicated the screening was of value. Student perceptions were positive in both use of fall risk screening as an IPE activity and improved perceptions of other disciplines roles, responsibilities, knowledge and scope of practice. **Implications:** Evidence-based interventions for common health conditions can be an effective IPE activity for students. Since each of the specific aims and IPE outcomes were realized, faculty are examining how to expand this into an on-going interprofessional activity.

**Implementing Student Pharmacist Tuberculin Skin Test Training Using Team-Based Learning.** Taylor G. Bertsch, *Washington State University*, Kimberly McKeirnan, *Washington State University*, Shannon G. Panther, *Washington State University.* **Objectives:** To evaluate the effectiveness of a Team-Based Learning (TBL) model in training students to properly place and interpret a tuberculin skin test (TST) in a laboratory course. **Method:** TBL was utilized to teach TST training to all second-year students pharmacists (n=120) in a patient care lab course. Immediately following lab, student feedback was gathered via an 11-question Likert scale survey inquiring student agreement with statements regarding their experience. IRB exempt status was granted for this research. **Results:** All 120 student pharmacists met competency during skills evaluation. One hundred and thirteen out of 120 (94.1%) of students responded to the survey. The majority of respondents either agreed or strongly agreed that TBL helped them meet the TST training learning objectives of: demonstrating administration proficiency (95.5%); demonstrating interpretation competency (93.8%); proper reporting and patient counseling with a positive test result (90.2%); and identifying when a second TST was necessary (89.3%). Additionally, respondents agreed or strongly agreed that the TBL model improved their knowledge of prelab material (89.3%), aided their confidence in practicing TST placement (88.4%), and that peer work in a TBL environment improved their communication skills (88.4%). **Implications:** The innovative training model enhanced students' ability to meet the TST learning objectives, increasing their knowledge and confidence. The activity could be replicated at other colleges expanding the development of student pharmacists who are confident in their ability to provide TST services.

**Implementing a Resident Academia Rotation and Its Impact on Their Teaching Philosophy.** Jane Bowen, *University of the Sciences*, Sanchita Sen, *University of the Sciences.* **Objectives:** Limited literature describes specific activities to achieve American Society of

Health-System Pharmacists (ASHP) teaching related objectives and the impact they have on a resident's teaching philosophy. This study aims to describe the implementation of a PGY2 academia rotation and to compare/contrast the resident's teaching philosophy pre- and post-rotation. **Method:** Two faculty co-preceptors reviewed ASHP goals and organizational taskforce recommendations to design an academia rotation that provides in-depth experience in 3 main faculty roles: teaching, service, and scholarship. The resident was evaluated with midpoint and final evaluations, and wrote a teaching philosophy pre- and post-rotation, which was analyzed for themes and changes. The study was considered exempt by the Institutional Review Board. **Results:** Four ASHP goals and 19 objectives were assigned to the rotation. Time was divided into 50% teaching, 28% service, 20% scholarship, and 2% other experiences. Three themes were identified in the resident's teaching philosophy: stimulating student interest, encouraging lifelong learning, and creating student-centered classroom environment. The largest teaching philosophy change was more details on how those themes could be achieved. **Implications:** The resident earned 'satisfactory progress' or 'achieved' in all rotation objectives, and demonstrated growth in the teaching philosophy. Challenges of developing the rotation included establishing a teaching approach of discuss-act-feedback-reflect and the time needed to coordinate faculty and staff. However, with appropriate planning, the logistics and structure can be successfully implemented. An academia rotation better prepares the resident for a faculty role and skills learned are transferable to educating patients and/or healthcare providers.

**Improving Pharmacy Students' Metacognition Through Formative Feedback on Exam Performance.** Lanae L. Fox, *University of Wyoming.* **Objectives:** To assess students' prediction of performance on a series of examinations within a course and to determine if formative feedback about their predicted and actual performance could improve their predictive abilities over time. **Method:** Students were asked to predict their overall exam performance and scores for each of the five topics on three course exams. Students were emailed after the two midterm exams with their predicted and actual scores for the entire exam and individual sections. Scores were analyzed across the three exams to evaluate if prediction ability improved. **Results:** In general, students were poor predictors of their exam performance, but this ability did improve over the course of the three exams. The top third of students tended to predict that their actual score would be lower than it usually was, while the lowest performing students tended to predict that their scores would be either higher or lower than actual performance. **Implications:** Continuous formative feedback on student performance versus predicted scores may be a way to improve students' metacognitive skills.

**Incorporating Novel Pedagogy Identified From an Innovation-Focused Student Assignment in a Health-System Pharmacy Laboratory Course.** Jennifer N. Wisniewski, *Medical University of South Carolina.* **Objectives:** To encourage students to think creatively and innovatively about their education and to identify unique educational techniques, students in a Health-Systems Pharmacy Laboratory course created an interactive activity to teach a concept taught previously in the fall 2016 semester. **Method:** At the start of the semester, students were assigned to groups and were given instructions to choose 1 taught concept and recreate it as an interactive activity. At the end of the semester, group projects were presented as a "science-fair". Peer assessment was used for partial grading and for gaining student perspective and feedback. Students were required to indicate whether their peers' project would be helpful if incorporated into future classes. Assessment of project classification, student perception, and grades



was conducted. The instructor selected a sample of presented techniques for future teaching. **Results:** Student group projects were classified as games (n = 16/25), videos (n = 3/25), and other (n = 6/25). All students had an overwhelmingly positive perspective on the assignment. Students felt it was fun, an excellent method of review, and recommended this be a course requirement for future classes. Students most often suggested board and online games be incorporated into future classes. The average grade for the assignment was 99.8 %. Student ideas utilized in the spring semester were Kahoot! and Jeopardy!. **Implications:** Encouraging students to consider and develop innovative educational techniques was well-received, benefitted student performance, and generated new ideas for faculty. This assignment will be used in future semesters.

**Incorporation of Digital Badges in a Pharmacy Skills Lab.** Erika L. Kleppinger, *Auburn University*, Amber M. Hutchison, *Auburn University*, M. Jeanna Sewell, *Auburn University*. **Objectives:** Digital badges are an electronic, graphical representation of an accomplishment, experience, skill demonstration, or competency. The objective is to describe the incorporation of badges in a skills lab and provide a summary of student perceptions. **Method:** Students could earn up to 8 badges during a PY1 fall semester lab course. Badge criteria included a combination of exemplary performance on required course activities and completion of optional bonus activities. Students were surveyed regarding impressions of badges, including how they plan to share badges with others. Descriptive statistics are used to report the number and type of badges earned as well as student survey responses. **Results:** A majority of the class (59.4%) earned 3-5 badges (n=143). Badges requiring work outside of class were earned by fewer students (vital signs exemplary 30.8%, BP 39.2%, glucose meter education 18.2%) compared to badges earned through in-class activities (vital signs 96.5%, BP master 58.0%, glucose meter master 65.0%, patient interviewing master 58.7%, new prescription counseling master 69.2%). Fifty-six students (39.2%) completed the survey. A majority of respondents (89.4%) had not heard of badges prior to this course. Students feel badges are a useful adjunct to traditional teaching methods (54.9%) and increased their desire to learn (49.0%). While only 11.8% indicated they will display badges on social media sites, 54.9% plan to display them on professional networking sites and 60.8% plan on sharing badges earned with future employers. **Implications:** Students perceive digital badges as a beneficial tool for enhancing learning. Further instruction on sharing badges with others is needed.

**Influence of Active Pharmacy Leadership Engagement on Student Attitudes and Self-Efficacy in Leadership Competencies.** Margarita V. DiVall, *Northeastern University*, Kelly J Chia, *Northeastern University*, Kimhouy Tong, *Northeastern University*, Mitchell J. Tucci, *Northeastern University*. **Objectives:** To evaluate coverage of leadership-related competencies throughout curricular, co-curricular, and extracurricular experiences and student attitudes towards these competencies and related self-efficacy. **Method:** Previously published 11 competencies related to leadership CAPE outcome were used to comprehensively map the curriculum. A survey administered to all P1-P4 students was developed to evaluate leadership co-curricular and extracurricular activities, and attitudes towards and self-efficacy in 11 leadership competencies. Descriptive statistics were used to evaluate student level of engagement in leadership activities and Mann-Whitney U test was used to compare students' attitudes/self-efficacy based on their level of leadership experience. **Results:** Curriculum mapping revealed that all but one competency (leading change) were covered in the didactic and experiential courses. 362 students (68%) completed

the survey. When 142 students (39%) who reported active engagement in pharmacy student organizations (e-board member or chair of committee) were compared to the rest of the cohort, statistically significantly better attitudes and self-efficacy were seen in 7 of 11 competencies. For those not actively engaged in leadership, 3 most commonly cited reasons were lack of time (54%), focus on academics (44%), and being engaged in non-pharmacy organizations (41%). Attitudes and self-efficacy of 72 students (19.9%) who reported active engagement in organizations outside of pharmacy did not significantly differ from those not actively involved in any leadership. **Implications:** Leadership competencies curriculum mapping gap analysis will be used to modify the curriculum. Active leadership engagement in pharmacy student organizations was associated with improved student attitudes towards leadership development and leadership competencies self-efficacy.

**Integration of Active Learning Pedagogies Within an Interprofessional Public Health Course.** Eva Y. Wong, *Marshall B. Ketchum University*, Patrick Yoshinaga, *Marshall B. Ketchum University*, Kimberly Clark, *Marshall B. Ketchum University*. **Objectives:** To integrate Student-Centered Active Learning Environment with Upside-down Pedagogies (SCALE-UP) within an interprofessional education (IPE) Public Health course to improve students' understanding of public health efforts towards disease prevention. **Method:** First year health professions students (n=186) from Colleges of Pharmacy (n=43), Optometry (n=100), and School of Physician Assistant Studies (n=43) participated in the IPE public health course. The SCALE-UP methodology was implemented through individual testing, group testing, group discussion and problem-solving activity on Healthy People 2020. Students were randomized to teams with representation from each profession to discuss and apply concepts of disease prevention and health promotion; Faculty members facilitated discussion and interactions between the IPE student teams. An individual and group examination was provided to assess the effectiveness of utilizing active learning pedagogies. **Results:** Application of SCALE-UP methodology within a health professions IPE course significantly enriched students' understanding and interest in the public health topic of disease prevention. There was a substantial improvement in mean exam score of each student cohorts: pharmacy, increase of 40.1% (t(42)=9.96, p<0.001); physician assistant, 19.2% (t(41)=7.33, p<0.001); and optometry, 21.3% (t(100)=11.1, p<0.001). **Implications:** Incorporation of active learning pedagogies (SCALE-UP) improved health professions students' conceptual understanding and ability to solve problems related to public health topics. It allows for students to learn from and amongst each other, develop communication and comprehension skills, and prepare for a collaborative practice workforce ready to provide quality care to improve public health outcomes.

**Integration of PY1 and PY3 Students in a Pharmacy Skills Laboratory.** Catherine Taglieri, *MCPHS University–Boston*, Steven J. Crosby, *MCPHS University–Boston*, Raymond Melika, *MCPHS University–Boston*, Joseph Ferullo, *MCPHS University–Boston*. **Objectives:** To evaluate the P3 students' ability to be "practice ready" to perform managerial functions of a pharmacist when supervising P1 students, functioning as interns, in a pharmacy skills laboratory. **Method:** A random sample of 71 students were selected from the P3 class of 305 students (23%) to be observed in the Community Pharmacy Practice lab at two points in time; the 1st (baseline) and the third (final) time working with P1 students. 58 students (19%) were evaluated at both time points. Students were evaluated on various aspects of business management, leadership and self-management, using a scale of 1 to 5, where 1 = never and 5 = always exhibits, by two trained

faculty members. Quality control was evaluated by student scores in each session. **Results:** Two areas of business management were evaluated; workflow and legal compliance. Student scores increase significantly baseline to final on workflow; 3.35 – 4.15 ( $p < 0.001$ ), but declined on legal compliance; 4.29 to 4.16, although not significant ( $p = 0.322$ ). All six areas of leadership increased significantly ( $p < 0.001$ ) and all six areas of self-management increased significantly ( $p < 0.001$ ). Scores on providing information (2.91 – 4.05) setting objectives with team (2.19 – 3.36), providing positive feedback (2.32 – 3.5) and suggestions to improve (2.14 – 3.25) showed the greatest gains ( $p < 0.001$ ). Student scores from baseline to final also showed a statistically significant improvement (76.26 to 77.26,  $p < 0.001$ ). Implications: Integrating P1 students with P3 students increased the P3 students' ability to perform managerial functions in a pharmacy skills laboratory.

**Integration of the Pharmacists' Patient Care Process at Albany College of Pharmacy and Health Sciences.** Courtney R. Caimano, *Albany College of Pharmacy and Health Sciences*, Nicole M. Lodise, *Albany College of Pharmacy and Health Sciences*, Aimee F. Strang, *Albany College of Pharmacy and Health Sciences*, Jeffrey M. Brewer, *Albany College of Pharmacy and Health Sciences*. **Objectives:** To assess integration of the PPCP into the pharmacy curriculum. **Method:** ACPHS began a coordinated effort in 2016 to integrate the PPCP into the pharmacy curriculum. Integration efforts included introducing the PPCP to P1 students during orientation, incorporating the PPCP into didactic and experiential course objectives, and including PPCP assessment into IPPE and APPE evaluations. Knowledge and skill development continued each semester in the Pharmacy Skills courses, Integrated Problem Solving Workshops, Pharmacotherapy modules, and IPPEs/APPEs through SOAP note writing, active-learning exercises, case discussions and patient encounters. A survey was distributed to faculty and students to assess awareness of PPCP integration. **Results:** Two hundred eight students (23%) and 21 faculty (28%) responded. Two faculty were not familiar with the PPCP while the remainder were aware (29%) or were teaching it (62%). The majority of respondents teaching the PPCP were pharmacy practice faculty. Sixty-six percent did not know when the PPCP was introduced to students and only 33% thought it was well-integrated. Student data demonstrated 96% of respondents were familiar with the PPCP and 58% used it in their coursework. P1 students were primarily exposed at a knowledge level while P2-P4 students practiced and were assessed. While students reported experience with all components, implementation and follow-up demonstrated a need for further incorporation. **Implications:** Coordinated efforts to integrate the PPCP into the curriculum have been successful, however, additional communication and faculty development are identified with an expanded focus on the implementation and follow-up process components.

**Interprofessional Curbside Consults (ICC) to Improve Student Achievement of Learning Outcomes.** Jennifer Kirwin, *Northeastern University*, Margarita V. DiVall, *Northeastern University*, Kristin C Greenwood, *Northeastern University*, Todd A. Brown, *Northeastern University*, Thomas M. Matta, *Northeastern University*, Janet Rico, *Northeastern University*, Romesh Nalliah, *University of Michigan*. **Objectives:** To implement and evaluate an interprofessional skills lab activity. **Method:** P3 students in a skills lab course learned about the SBAR technique, usual roles / responsibilities of healthcare professionals and participated in brief simulations involving student HCPs (sHCP) with student nurse practitioners, physical therapists, nurses, and dentists asking drug-related questions. Trained instructors debriefed pharmacy students and sHCP after the simulation. Instructor

training consisted of written materials, reputable videos about debriefing, and a video created to apply best practices to the Skills Lab ICCs. Achievement of learning outcomes was evaluated with an e-rubric mapped to relevant CAPE outcomes (Collaborator, Communicator, Problem-Solver, and Educator). Students also completed "The Self-efficacy for Interprofessional Experiential Learning Scale" before and after completing 4 ICC simulations and a supplemental course evaluation. **Results:** Student performance on ICCs was good, with average scores from 89-93. Evaluation of achievement of outcomes revealed that all students attained desired threshold for covered competencies with the exception of Educator (18% did not meet threshold). Statistically significant improvement was seen on all 16 items of the self-efficacy scale on pre- and post-comparison. Pharmacy students reported learning something from and teaching something to the sHCP 85% and 75% of the time, respectively. sHCP reported learning something from the pharmacy student 100% of the time. Both pharmacy and sHCP agreed the debriefing sessions were generally organized and led to self-reflection. **Implications:** ICC activities provided a forum for interaction with sHCP, allowed documentation of competency achievement, and identified areas where additional instruction is needed.

**Interprofessional Education (IPE) Activities at Colleges and Schools of Pharmacy in the United States (US).** Dana G. Carroll, *Auburn University*, Angela Bingham, *University of the Sciences*, Kevin Chamberlin, *University of Connecticut*, Rima Mohammad, *University of Michigan*, Nancy T. Williams, *Southwestern Oklahoma State University*. **Objectives:** The purpose of this study was to identify current IPE activities at colleges/schools of pharmacy in the US and common barriers or challenges to IPE activities. **Method:** A survey was developed and distributed via Qualtrics to pharmacy practice department chairs ( $n = 162$ ) at colleges/schools of pharmacy within the US. Two weeks after the initial survey distribution, a follow-up email was sent to elicit responses from non-responders. **Results:** Forty-nine (30%) colleges/schools of pharmacy responded to the survey. Most respondents (84) were from colleges/schools that had been established for more than five years and public institutions (59%). The majority of colleges/schools reported internal collaboration or a combination of internal and external partners. Most common IPE partners included medicine, nursing/nurse practitioners, physician assistants, physical/occupational therapy and social work. IPE activities most commonly reported include in-class case discussions, simulations, and student-run health screenings. Over half of the respondents reported learners having two to five formal IPE experiences in the curriculum (excluding APPE and IPPE experiences), and most (86%) reported assessments after each IPE activity. Colleges/schools most commonly reported partial to no funding for IPE activities on both the college/school (60%) and university (60%) levels. Common barriers reported to developing and/or implementing IPE include adequate space, time, and/or availability of other professions, scheduling difficulties, and limited finances. **Implications:** While IPE is a requirement for all accredited colleges/schools of pharmacy, institutions are individually adapting to develop and implement IPE that works for them. There are numerous barriers associated with IPE implementation which are unique to each institution.

**Introduction of 3D Printed Formulations in a Compounding Course.** Ashlee N. McMillan, *West Virginia University*, Werner J. Geldenhuys, *West Virginia University*. **Objectives:** Evaluate student perceptions of 3 Dimensional (3D) printed pharmaceutical formulations before and after a laboratory session introducing students to the topic. **Method:** A laboratory was designed and implemented in

a first professional year course titled Preparation of Pharmaceutical Products. The laboratory introduced students to 3D printing and its role in pharmacy. The laboratory also allowed them to design a pharmaceutical device to be printed on a 3D printer. Students were provided with an anonymous survey to complete before and after the laboratory session that assessed their perception of 3D compounding. **Results:** Prior to the laboratory session only 6.1% of students who completed this survey were familiar with 3D pharmaceutical products. After completing one laboratory session, 93.8% of respondents agreed or strongly agreed that 3D printed products could be formulated by a pharmacist, and that 3D printed product formulations have the potential to increase revenue in a pharmacy, compared to 42.4% and 72.7% respectively prior to the laboratory session. Additionally after the session, 96.9% felt that 3D printing should be taught in the PharmD curriculum. **Implications:** 3D compounding is a relatively new area for pharmacists. This study demonstrated that after learning more about the topic students felt that pharmacists have a role in 3D printing and that this topic should be taught in the PharmD curriculum.

**JCPP Pharmacists' Patient Care Process (JCPP-PPCP): Should We Reinvent the Wheel?** Jennifer Kirwin, *Northeastern University*, Andrew Krevat, *Northeastern University*, Angelika Lukasik, *Northeastern University*, Margarita V. DiVall, *Northeastern University*. **Objectives:** To evaluate the extent to which steps of the JCPP-PPCP are covered and assessed in existing skills-lab courses. **Method:** Our Comprehensive Disease Management Skills Lab course series spans 3 semesters, accompanying didactic and seminar courses in Pharmacotherapeutics. Performance based activities are evaluated with e-rubrics mapped to CAPE outcomes. Existing e-rubrics were further mapped to the JCPP-PPCP competencies grouped by 5 steps with independent validation by two faculty members. Data from the 2015-2016 course series was analyzed to assess student achievement of JCPP-PPCP competencies, and evaluated for gaps in coverage. **Results:** 32 laboratory assessments were evaluated by 10 rubrics in a cohort of 122 students. Of the 5 JCPP-PPCP steps, "Collect" was mapped to 41 rubric dimensions in 26 assessments and had the highest level of achievement by students ( $95.4 \pm 3.8\%$ ). "Assess" was mapped to 25 rubric dimensions on 26 assessments ( $93.9 \pm 4.6\%$ ). "Plan" was mapped to 6 rubric dimensions on 19 assessments ( $89.1 \pm 6.7\%$ ). "Implement" was mapped to 29 rubric dimensions on 26 assessments ( $84.2 \pm 6.2\%$ ). "Follow-up: Monitor/Evaluate" was mapped to 6 rubric dimensions on 15 assessments ( $85.4 \pm 7.7\%$ ). Competency in all 5 steps was demonstrated by 89% of students (defined as  $>73\%$  aggregate score). **Implications:** The analysis demonstrated that all 5 JCPP-PPCP steps were already extensively assessed in the course series. Additional opportunities to assess "Follow-up: Monitor/Evaluate" and "Plan" could be integrated. This mapping framework could be used by other programs to examine the extent to which existing curricula prepares students with the skills and competencies of JCPP-PPCP prior to substantial revision.

**Knowledge, Attitudes and Practice of Student Pharmacists Towards Public Health Within Namibia, Zambia, and Zimbabwe.** Miranda G. Law, *University of North Carolina at Chapel Hill*, Prosper Maposa, *University of Zimbabwe*, Elias Chambula, *University Teaching Hospitals, Lusaka Children's Hospital Pharmacy*, David R. Steeb, *University of North Carolina at Chapel Hill*, Stephen F. Eckel, *University of North Carolina at Chapel Hill*, Gregory Duncan, *Eastern Health Clinical School, Monash University*. **Objectives:** To explore the knowledge, attitudes and practice of final year student pharmacists towards public health in select countries of sub-Saharan Africa. **Method:** Knowledge, attitudes and practice of final-year student pharmacists in

Namibia, Zambia and Zimbabwe were assessed through an exploratory 17-item survey, administered anonymously either electronically or via paper. The survey included five demographic questions and 12 likert scale/multiple choice items. Trends and correlations in knowledge, attitudes and practice towards public health were assessed using descriptive statistics, Mann-Whitney U, and difference in proportions statistical tests. **Results:** Eighty-two per cent of students responded to the survey ( $n=129$ ). The majority (95%) of students are interested in contributing to public health and feel, as pharmacists, they have the responsibility to do so. Additionally, the majority of students would like more education during pharmacy school on health promotion (93%) and disease prevention (89%). Students who participate in public health activities during school show increased interest in contributing to public health compared to those who did not ( $p=0.04$ ). Despite their interest, low numbers of student pharmacists feel that pharmacists are currently utilized in disease prevention (35%) and health promotion (42%) within their country. **Implications:** Student interest can be a driving force to advance pharmacy education and practice related to public health, possibly increasing pharmacist opportunities in public health to meet healthcare needs in under-resourced areas. American pharmacists and schools of pharmacy have the opportunity share experiences from pharmacy practice and education related to public health with under-resourced countries to aid in these developments.

**Lessons Learned in an Interventional Reflective Writing Study of APPE Students.** Tamara Malm, *University of Saint Joseph*, Jennifer Podoloff, *University of Saint Joseph*, Michele Riccardi, *University of Saint Joseph*, Andrea L. Leschak, *University of Saint Joseph*. **Objectives:** To describe the advantages, disadvantages, and lessons learned in an interventional reflective writing study of advanced pharmacy practice experience (APPE) pharmacy students. **Method:** Enrollment occurred across four faculty APPE sites between July 2016 and January 2017. Sites were randomized into either a control or intervention arm. Students participated for six weeks during their APPE rotation. Students in both arms were asked to complete paper based forms to include a pre-APPE survey and goal planning document and a post-APPE survey and goal achievement evaluation. Intervention students completed a 30-minute PowerPoint® training session on reflective writing. Data from surveys was collected and analyzed in Excel. Faculty feedback was electronically collected continuously across the study period. **Results:** Results from the post-APPE survey and goal evaluation showed students in the intervention arm reported advantages including the evaluation of goal planning strategies, development of SMART goals, and regular reassessment of goal accomplishments. Disadvantages of the study were largely logistical. Students found "soft deadlines" for writing promoted procrastination and limited completion of all goals. Goal setting at the beginning of rotation inhibited students from modifying goals to incorporate new opportunities. Faculty found paper surveys difficult to coordinate and identified that interruptions of the rotation schedule due to conferences, holidays, and interviews affected writing time. **Implications:** This study team learned there are several meaningful advantages to the implementation of reflective writing during APPE. The intervention required little faculty/student time investment making it feasible at any APPE site. Faculty flexibility and planning is encouraged to enhance student's goal planning success.

**Long-Term Impact of a General Medicine Elective Course on Student Perceptions of APPE Readiness.** Dayna N. LeSueur, *Alnylam Pharmaceuticals*, Alexa A. Carlson, *Northeastern University*, Stephanie L. Sibicky, *Northeastern University*, Mark Douglass,

*Northeastern University*, Margarita V. DiVall, *Northeastern University*, Michael Gonyeau, *Northeastern University*, Adam B. Woolley, *Northeastern University*, Jason W. Lancaster, *Northeastern University*. **Objectives:** To examine student perceptions of the impact of a general medicine elective course on advanced pharmacy practice experience (APPE) readiness. **Method:** Principles of General Medicine is a two-credit elective course offered to P3 students designed to simulate typical student responsibilities during a general medicine APPE. This project included surveying students six months after course completion during APPEs. Survey questions asked students to report self-efficacy on major course outcomes related to APPE readiness and feedback on course activities/assessments that contributed to APPE readiness. **Results:** Ten students completed the course and 8 (80%) completed the follow-up survey. All 8 students agreed that class activities prepared them for APPEs, including mock rounds, patient-based discussions, patient presentations, mock text-pages, and drug information questions. All students agreed that Joint Commission of Pharmacy Practitioners Pharmacist Patient Care Process reinforcement throughout the course prepared them to participate in patient care. Of respondents, 75% felt better prepared than fellow students on APPEs and several students felt better prepared for other APPEs. One student desired further preparation for communicating with the other pharmacists and the medical team as well as managing multiple patients. **Implications:** Students completing a general medicine elective reported that they were prepared for clinical practice, thus, supporting the continued development of this course. Future iterations will address areas for improvement based on survey responses.

**Longitudinal Assessment of Clinical Documentation Skills in an Accelerated Doctor of Pharmacy Curriculum.** Lisa P. DeGennaro, *University of Saint Joseph*, Dora E. Wiskirchen, *University of Saint Joseph*. **Objectives:** There is limited literature describing effective techniques for SOAP note instruction in an accelerated, block-style doctor of pharmacy curriculum. The objective of this study was to evaluate student performance on SOAP note writing following two curricular interventions in an accelerated curriculum. **Method:** The first intervention included an introduction to SOAP note writing, practice writing SOAP notes in small groups and completion of an individual graded SOAP note during a Patient Assessment course at the beginning of the P2 year. For the second intervention, students wrote and received feedback on three group SOAP notes prior to completing an individual graded SOAP note during an Infectious Disease course. Faculty graded individual SOAP notes using a standardized rubric (scale 0-100). Overall scores and section scores (subjective/objective, assessment, and plan) were compared after the first and second interventions using a paired t-test. **Results:** Sixty-one students consented and were evaluated. A 17.5% increase in overall scores was observed from the first to second intervention. Mean ( $\pm$  SD) scores after the first and second interventions were  $65 \pm 15$  and  $76 \pm 15$ , respectively ( $p < 0.001$ ). The change in overall score was driven by a significant increase in plan scores, and a modest increase in subjective/objective scores ( $p < 0.001$ ). Assessment scores remained unchanged ( $p = 0.88$ ). **Implications:** Incorporating longitudinal instruction and assessment of clinical documentation skills is a challenge in accelerated, block-style curriculums. However, use of a standardized rubric and as few as two formal touch points can have a significant impact on improving students SOAP note writing skills.

**Longitudinal Evaluation of Professionalism From the First to Third Year of a Professional Pharmacy Program.** Mary Faure, *North Dakota State University*, Heidi Eukel, *North Dakota State University*, Jeanne E. Frenzel, *North Dakota State University*, Elizabeth

T. Skoy, *North Dakota State University*. **Objectives:** Evaluate whether students' self-assessed professionalism increased from P1 to P3 year in a professional pharmacy (PharmD) program, and to evaluate the influence of certain demographics (sex, age, employment in a pharmacy, other degrees held, student organization membership, and years of undergraduate education) and their impact on longitudinal changes in self-evaluated professionalism scores. **Method:** The Professionalism Assessment Tool (PAT), a valid instrument used to evaluate the professionalism of students, was administered twice throughout the P1 and P2 year and three times throughout P3 year. The PAT is comprised of 33 items within five domains, which represent the major tenants of professionalism in pharmacy. Data was collected each semester from 2013 to 2016, and responses for the class of 2017 ( $n = 85$ ) were matched and analyzed, as this cohort provided a full dataset across the entire didactic curriculum. **Results:** Increases in all five domains of the PAT were noted as students progressed through each year of the curriculum. Domains one (Reliability and Responsibility), two (Lifelong Learning and Adaptability), five (Citizenship and Professional Engagement), and total score showed statistically significant improvement in pre and post scores. Domain three (Relationships with Others) showed statistically significant changes for the P2, P3, and P1/P3 assessment periods. Sex, pharmacy work experience, additional degrees, and years of undergraduate education did not significantly contribute to changes; however, number of student organizations and age group had statistically significant impact. **Implications:** Longitudinal improvement was shown in student self-assessment of professionalism over the course of the didactic curriculum and was not affected by most demographics.

**Making Data-Driven Quality Improvement Decisions: Evaluation of the Impact of a Continuing Education Program.** Rosalyn P. Vellurattil, *University of Illinois at Chicago*. **Objectives:** Strategic planning and outcomes assessment is essential for programmatic improvement. Quality improvement changes should be made on collected data and evidence to inform decisions. The objective of this study is to evaluate a continuing education program and to share data-driven results and outcomes for quality improvement. **Method:** A formal assessment plan was created in fall 2015 for the Office of Continuing Education pertaining to its goals and mission. Programmatic outcomes data were documented and collected biannually. The assessment plan targeted achievement of program goals (participant satisfaction and learning, quality) and mission (total number of activities, audience, activity type, and activity delivery). **Results:** A total of 162 hours of continuing education activities was offered in 2015 ( $N = 112$  live,  $N = 9$  enduring). Mean satisfaction with and quality of activities was 4.53 and 4.56, respectively. The ability for an activity to be free of bias/commercialism was good (mean 4.68). Approximately 99% of pharmacists and 1% of technicians participated in activities, and all participants showed an increase in knowledge (mean 4.26). One hundred percent of non-jointly provided activities were delivered to one or more stakeholder groups. Overall, 89% of goals were achieved. **Implications:** A formal assessment plan allowed data collection and analysis to be performed consistently using evidence based outcome measures. Quality improvement included modification of activity evaluation instruments to address competence, enhanced marketing of non-joint provided activities, and considerations for mission updates that will drive educational initiatives forward.

**Measuring Changes in Pharmacy and Nursing Students' Perceptions Following an Interprofessional High-Fidelity Simulation Experience.** Nicholas Fusco, *University at Buffalo, The State University of New York*, Kelly Foltz-Ramos, *University at Buffalo, The State*

*University of New York. Objectives:* To evaluate the effects of inter-professional high-fidelity simulation-based learning (SBL) on pharmacy and nursing students' perceptions of interprofessional care. **Method:** Third-year pharmacy and senior nursing students participated in an interprofessional high-fidelity SBL experience consisting of two hospital-based scenarios followed by a debriefing. The "Student Perceptions of Interprofessional Clinical Education-Revised" (SPICE-R) instrument was administered pre- and post-SBL. The "Student Satisfaction and Self-Confidence in Learning" (SSSCL) instrument, which uses a 5-point Likert score, was administered post-SBL. Descriptive statistics were used to characterize the data, and the Wilcoxon Signed-Rank and Mann Whitney U tests were used to evaluate pre-/post-SBL scores and between-group differences in scores, respectively. **Results:** A total of 104 (78%) pharmacy and 93 (77%) nursing students completed both the pre- and post-survey instruments. Baseline differences between pharmacy and nursing students included number of clinical hours completed [200 (190 – 240) vs. 210 (209 – 210);  $p < 0.001$ ] and previous/current experiencing working directly with other healthcare professionals [71 (53%) vs. 88 (73%);  $p < 0.001$ ]. Median score increases were observed for 10/10 SPICE-R items ( $p < 0.01$ ) and 9/10 SPICE-R items [ $p < 0.02$ ] for pharmacy and nursing students, respectively. The change in SPICE-R items between pharmacy and nursing students was similar. All students rated both the experience and their confidence highly on the SSSCL (median 4-5/5); however, nursing scores were higher than pharmacy scores for 7 of 13 items ( $p < 0.05$ ). **Implications:** An interprofessional high-fidelity SBL experience increased pharmacy and nursing students' perceptions of interprofessional care.

**Measuring Student Pharmacists' Ability to Simplify Complex Medication Regimens.** Clark Kebodeaux, *University of Kentucky*, Mikael D. Jones, *University of Kentucky*, Aric Schadler, *University of Kentucky*, Scott M. Vouri, *St. Louis College of Pharmacy*. **Objectives:** Pharmacists are medication experts with the capability and expertise to impact medication management and improve patient care, particularly when polypharmacy is present. This study aims to assess student pharmacists' ability to impact administration of complex prescription regimens using a standardized laboratory exercise. **Method:** P1 and P3 student pharmacists completed a required activity during the laboratory sequence to simplify and organize a complex medication regimen. Students organized how and when they would advise a patient to take 7 fictitious medications with distinct instructions over a 24-hour period using a medication box. A picture documenting each students' activity was used for data analysis. T-test and chi-square analysis were used to compare performance between P1 and P3 students. **Results:** 139 P1 and 136 P3 students (99.6% RR; 275 total) consented for their activity to be used in the analysis. Student pharmacists recommended a mean of 5.1 (SD 1.01; Range 3 – 9) dosing intervals per 24 hours with 26.2% of students able to successfully organize the regimen to 4 total intervals. P3 students were more effective than the P1 students at the total frequency in dosing (4.63 vs. 5.55,  $p < 0.0001$ ), more likely to organize the regimen into 4 times/day (43.0% vs. 10.8%,  $p < 0.0001$ ), less likely to have dosing errors (11.72% vs. 31.65%,  $p < 0.0001$ ) and/or dose the regimen greater than 6 times daily (2.3% vs. 14.4%,  $p < 0.0005$ ). **Implications:** Student pharmacists gain more effectiveness organizing complex medication regimens with curricular experience. Student pharmacists can potentially improve patients' self-organized medication regimens as described in previous research.

**Medical Spanish Usage After a Medical Spanish Elective Course.** Geoffrey Mospan, *Wingate University*, Carrie L. Griffiths, *Wingate University*. **Objectives:** To determine the type and frequency of

interactions with Spanish-speaking patients (SPPs) by student pharmacists (SPs) after completion of a Medical Spanish (MS) elective course. **Method:** After obtaining exempt status from the RRB, a 9-question electronic survey was sent to 28 SPs while completing their APPE rotations who completed the MS elective 15 months prior. The survey asked basic demographics and assessed the SPs' interactions with SSPs both at work and on rotation. **Results:** 25 SPs completed the survey (89%). A majority of the SPs were employed and worked outside of rotation (76%). Of these, 15 worked 1-2 days/week (79%). 13 of 19 SPs (68.4%) interacted with a SPP at least once weekly, with the majority interacting 1-2 times weekly (47%). Types of interactions by SPs with SSPs at the workplace included: providing medication directions in Spanish (68.8%), conducting a transaction (68.8%), and recommending an OTC product based on patient symptoms (62.5%). A total of 16 SPs reported using Spanish while on rotation (64%). Spanish was utilized most frequently on community pharmacy-chain (68.8%), independent (31.3%), and ambulatory care (37.5%) rotations. Types of interactions included: medication counseling (81.3%), gathering patient information (75%), and providing medication directions in Spanish (50%). **Implications:** The results of this survey demonstrate that SPs who completed the MS elective continued to use Spanish with their patients. Results of this study show this important skill set is being utilized by SPs up to one year later. Future studies include retention, abilities, and comfort levels in using MS.

**Medication Error Simulation With Second Year Pharmacy Students at a Multisite College of Pharmacy.** James Wheeler, *The University of Tennessee*, Andrea S. Franks, *The University of Tennessee*. **Objectives:** To assess team performance and student perceptions of self-efficacy regarding medication safety skills after implementation of team project in a required course during the second year of the professional curriculum. **Method:** Teams ( $n=29$ ) comprised of 6 to 7 student pharmacists were assigned documented medication errors from the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Network (PSN) database. To integrate the course's three main content areas (drug information, technology, and safety), teams completed the following activities for the project: (1) a literature search to identify previous case reports, (2) a mock error report submitted to the Institute for Safe Medication Practices (ISMP) or Food and Drug Administration (FDA) Med-watch program, (3) a simulated root cause analysis (RCA) investigation and (4) design of a technological or other intervention to prevent future errors. As a non-graded activity, students practiced disclosing a mock medication error to patients by creating Google voice™ recordings after lectures on error disclosure. The course director evaluated each team's project via a scoring rubric designed to assess project components. Students completed pre/post self-efficacy assessments describing their confidence in medication safety processes. **Results:** The mean project rubric score was  $93.9 \pm 7.0$  (SD) of 100 points. Sixty students completed the pre-post self-efficacy survey. Students perceived improved skills in management of medication errors including: identification ( $p < 0.001$ ), documentation ( $p = 0.003$ ), disclosure to patients ( $p = 0.413$ ) and prevention ( $p < 0.001$ ). **Implications:** Limited research on pharmacy medication safety training is available. Team based medication error projects represent an innovative way to simulate medication safety management.

**Medicinal Cannabis in Pharmacy Education: Time for a Curricular Change or Just Reefer Madness?** Daniel T. Abazia, *Rutgers, The State University of New Jersey*, Mary M. Bridgeman, *Rutgers, The State University of New Jersey*, Patrick J. Bridgeman, *Rutgers,*

*The State University of New Jersey, Marcus G. Sturgill, Rutgers, The State University of New Jersey.* **Objectives:** Medicinal cannabis is approved for use in 28 states within the U.S., the District of Columbia, Guam and Puerto Rico as of January 2017. This study evaluated attitudes of licensed pharmacists in New Jersey toward medicinal cannabis, including identification of knowledge gaps regarding efficacy, safety, and counseling. **Method:** With Institutional Review Board approval and informed consent, an anonymous 25-item electronic survey of licensed pharmacists in the State of New Jersey was conducted. **Results:** Of 13,231 pharmacists invited to participate, 1261 (10.1%) consented to survey participation [610 (49%) female, 633 (51%) male; 289 (23%) under age 39 years, 453 (36%) aged 40-59 years, 214 (17%) older than age 60 years; 560 (45%) having the Bachelors of Science degree, 683 (55%) having the Doctor of Pharmacy degree]. A majority of survey respondents agreed [544 (44%)] or strongly agreed [604 (49%)] that medicinal cannabis should be incorporated into pharmacy continuing education activities and that information about medicinal cannabis should be incorporated into pharmacy school curricula [553 (45%) and 573 (47%), respectively]. Conversely, pharmacists surveyed identified a lack of confidence in their own knowledge of medicinal cannabis, including in their ability to speak with other healthcare professionals or in counseling or answering questions from patients or caregivers about efficacy, adverse effects, or drug interactions. **Implications:** As a therapy garnering national attention and growing support for use, changes in state legislation and the pharmacist's role with medicinal cannabis dispensing mandate that additional education on this topic be included in pharmacy curricula and pharmacy continuing education activity planning.

**Midpoint Analysis of a First Professional Year Pharmacy Student Wellness Program.** Lisa A. Salvati, *Ferris State University*, Colleen M. Lewellyan, *Ferris State University*, Allison C. Bouwma, *Ferris State University*, David R. Bright, *Ferris State University*, Minji Sohn, *Ferris State University.* **Objectives:** To identify wellness-related needs and assess the impact of wellness-related offerings among first professional year (P1) pharmacy students. **Method:** During the 2015-2016 and 2016-2017 academic years (AY), a survey assessing sleep, stress, diet, exercise, and illness was distributed to P1 students in September, December, January, and April via QuestionPro®. Height, weight, and blood pressure were collected in September, December, and April. Exercise and nutrition classes were offered regularly in the second year of the program. The Kruskal-Wallis and Mann-Whitney tests were used to compare ordinal data; ANOVA and a t-test were used to compare continuous data. **Results:** The 2015-2016 surveys were distributed to 154 students; response rates ranged from n=31-73 (20.1-47.4%). Students reported dissatisfaction with their diet, weight and exercise (48.1%, 53.9% and 75.1%, respectively). The 2016-2017 surveys were distributed to 139 students; response rates ranged from n=41-81 (29.5-58.3%). As compared to the 2015-2016 AY cohort, the 2016-2017 AY cohort demonstrated decreased stress based on Cohen Perceived Stress Scale score (14.1 vs. 16.7, p=0.0278) and had a higher BMI (26.2kg/m<sup>2</sup> vs. 23.9kg/m<sup>2</sup>, p=0.0336). Students that reported attending nutrition classes and incorporating knowledge ate out less frequently per week than those that did not attend/incorporate knowledge (1.4 vs. 2.3, p<0.001) and ate more fruit servings daily (2.3 vs. 1.3, p=0.0326). **Implications:** The 2015-2016 and 2016-2017 AY cohorts demonstrated significant differences in baseline health. Students that took part in the wellness-related interventions demonstrated improvement in healthy lifestyle habits. Future work to identify wellness-related offerings that yield maximal value and participation may be of value.

**Multi-Modal Approach to Teaching Cultural Competency.** Gina M. Prescott, *University at Buffalo, The State University of New York*, Alyssa M. Nobel, *University at Buffalo, The State University of New York.* **Objectives:** To assess first-year pharmacy (P1) students' grades and preferred methods for teaching cultural competency. **Method:** A multimodal approach was used to teach cultural competency to students in a pharmaceutical care course. The time allotted for this topic was a 2-hour lecture and 4-hour practicum. Students completed the following during the lecture period: Global Beads Activity (for bias identification), a didactic lecture (key terms and basic cultural information), Trading Places exercise, and an in-class quiz. Included in the practicum were: clips of the "Worlds Apart" series, individual patient counseling interview, reflective questions on culture, and a 5-point Likert survey on cultural background and teaching modality impact. All data was de-identified and analyzed in an Excel spreadsheet after grades were submitted. **Results:** P1 students (n=136) were enrolled in the course with students agreeing they were aware of society's cultural diversity (mean=4.13), although fewer reported having culturally diverse relationships (mean=3.6). The mean in-class quiz and practicum grades were 86% and 93%, respectively. The practicum counseling (mean=4.26), didactic lecture (mean=4.15), and Worlds Apart videos (mean=4.06) had the highest student impact. The Global Beads activity (mean=3.79) and trading places exercise had lower impact scores (mean=3.73). Common themes on the reflection questions included: differences in patient beliefs/customs, prioritizing the patient, and being flexible/adaptable. **Implications:** Students' grades were good regardless of the cultural competency teaching approach. Students preferred an interactive counseling practicum for learning and implementing cultural competency as opposed to activities aimed at teaching them about their own biases.

**OPIOIDS: Cultivating Interprofessional Collaboration to Find Solutions to Public Health Problems.** Keri D. Hager, *University of Minnesota*, Heather Blue, *University of Minnesota*, Lei Zhang, *University of Minnesota CTSI*, Laura C. Palombi, *University of Minnesota.* **Objectives:** Evaluate the effectiveness of an interprofessional (IP) case-based activity that allowed medical and pharmacy students to engage in problem-solving around the role of Social Determinants of Health (SDOH) in opioid abuse and misuse. **Method:** The current study utilized a mixed-methods approach. Students participated in a case-based activity, and then completed a post-activity survey that included both five open-ended questions and the Interprofessional Collaborative Competency Attainment Survey (ICCAS), organized into composite measures aligned with the activity learning objectives. **Results:** Twelve pharmacy students (100%) and 49 medical students (74%) completed the post-activity survey. Composite measure ICCAS results indicate the activity resulted in a statistically significant increase in student ability to 1) recognize IP team members' knowledge, skills, abilities, and contributions to the interprofessional team, 2) communicate effectively across professions, and 3) learn with, from, and about interprofessional team members to develop a patient care plan. Students reported enhanced understanding of treatment considerations with opioid misuse, the role of SDOH, and recognition of the value of interprofessional collaboration in their future practice. **Implications:** This interprofessional case-based activity promoted collaboration among students from different professional programs as they engaged in problem-solving around a contemporary public health issue that closely intersects their future practices. This activity may serve as a model for health professional programs, current practitioners, health care systems, and communities that seek interprofessional solutions to combat opioid misuse.

**Online Pharmacy Research Survey on Oral Contraceptives With a Focus on Emergency Contraceptives.** H. Catherine McCarthy, *Teva Pharmaceuticals*, Cynthia M. D'Angelo, *Teva Pharmaceuticals*, Kelly C. Cleland, *Princeton University*, Ali Pohlmeier, *Teva Pharmaceuticals*, Judith Wackenhut, *Teva Pharmaceuticals*, Boxiong Tang, *Teva Pharmaceuticals*. **Objectives:** To assess the attitudes and behaviors of retail pharmacists with oral contraceptives (OC) and emergency contraceptives (EC) and their counseling experience. **Method:** An online survey was sent to retail pharmacists in the Pharm/alert® database in December 2016. Survey questions focused on OC/EC counseling, pharmacist's education on these classes of medication and the barriers they face in EC dispensing. Pharmacists were also asked what additional resources would be helpful in EC counseling. **Results:** A total of 450 pharmacists, with  $\geq 2$  years of experience, completed the survey. The most common OC information provided to patients was about missed doses (79.1%) followed by drug interactions, side effects, and cost/insurance. OC education in pharmacy school was limited to one or two lectures according to 70.9% of participants. EC questions were reportedly received  $< 5$  times per week (90.4%); information provided relates to timing of use (78.9%) followed by side effects, effectiveness and cost/insurance. Pharmacists, on average, ranked their comfort level with EC counseling as 5.2/7.0 (7.0 = extremely comfortable/confident). Most pharmacists (81.1%) identified continuing education courses as the primary method for learning about ECs. Among respondents, cost was considered to be the main barrier with dispensing ECs. Participants identified a desire for EC manufacturers to provide printed educational materials for patients. **Implications:** Pharmacists are an easily accessible resource to patients available to provide counseling and education, if desired. Gaining an understanding for pharmacists' encounters with OC/EC counseling, as well as their attitudes and behaviors allows for development of proper and effective resources and education.

**Patient's Perception on the Importance of Disclosing Medications to Dentists.** Kalin L. Johnson, *Creighton University*, Joseph Franco, *Creighton University School of Dentistry*, Laura Harris-Vieyra, *Creighton University School of Dentistry*, Diana Ndunda, *Creighton University*. **Objectives:** Medications play an important role in dental care. An accurate medication history will allow the dentist to evaluate a patient's health, disease states, drug-drug interactions, and the effect on dental treatment and oral health. Creighton University's dental clinic has an in house pharmacist and APPE rotation students to aide in acquiring medication histories. The objectives of this study were to discover the perceived importance and likelihood patient's found in disclosing their prescription, OTC, and herbal/supplement medications to their dentist. **Method:** A voluntary patient survey was administered to all patients 19 years of age and older in Creighton University's dental assessment clinic. There were nine questions on the survey used to assess how many prescription, OTC, and herbal/supplement medications patients took, if they informed their dentist of these medications, and if it was important to inform the dentist about each of these classes of medications. **Results:** There were 217 surveys completed and evaluated. A total of 60.83%, 70.97%, and 48.85% of patients said they were taking at least one prescription, OTC, and herbal/supplement medication respectively. The data showed that 75.58%, 69.12%, and 63.59% of patients thought it was very important to inform their dentists of their prescribed, OTC, and herbal/supplement medications respectively. **Implications:** Our survey showed that patient's perception of the importance of informing their dentists of their medications decreased from prescription, to OTC, and to herbals/supplements respectively. This survey demonstrated the opportunity

for pharmacists and our APPE students to educate patient's on the roll their medications play in oral health and dental treatment.

**Patient-Centered Communication Uptake During a Community Pharmacy IPPE: A Qualitative Analysis.** Catherine E. O'Brien, *University of Arkansas for Medical Sciences*, Rachel A. Stafford, *University of Arkansas for Medical Sciences*, Benjamin Teeter, *University of Arkansas for Medical Sciences*, Jessica Reid, *University of Arkansas for Medical Sciences*, Nalin Payakachat, *University of Arkansas for Medical Sciences*, Amy M. Franks, *University of Arkansas for Medical Sciences*. **Objectives:** To explore themes in written student reflections on the uptake of patient-centered communication (PCC) during a community pharmacy IPPE. **Method:** PCC, which includes motivational interviewing (MI), was a required spring semester course for P1 students prior to their Community Pharmacy IPPE. Following the IPPE, students submitted written reflections on the utilization of PCC during the IPPE. Reflections were de-identified for analysis. A deductive approach was used for data analysis in which predetermined themes were established first, followed by a constant comparison method to finalize thematic codes. Each reflection was coded independently by 2 coders using MaxQDA v12 qualitative analysis software. Discrepancies were resolved through in-depth discussion and negotiated consensus. **Results:** A total of 951 thematic codes were generated from 116 reflections. Reflections included themes of PCC as a learning experience (78%) and benefits gained by the student (28%). Students indicated that patient interactions went well (44%) and were overall patient-centered (44%), and that using PCC helped to discover a potential safety issue (13%). The most frequent MI skills coded were identifying and/or reflecting core concerns (69%), providing information in a patient-centered manner (22%), and exploring understanding (16%). The most frequently identified barriers to applying PCC skills were inexperience with MI (10%) and poor general communication skills (17%). **Implications:** Students successfully utilized PCC skills during their IPPE. Barriers and challenges identified will help tailor the classroom experience and practical guidance offered to students. Prompted reflection encourages practical application and reinforcement of communication skill development and should be included throughout the curriculum.

**Peer or Instructor Feedback in Preparation for End-of-Semester Performance-Based Testing.** Daniel S. Longyshore, *Wilkes University*, Steven Kheloussi, *Wilkes University*. **Objectives:** To review student performance during moderate-to-high stakes performance-based assessment (PBA) after receiving feedback from their peers versus instructor in a formative feedback exercise. **Method:** De-identified student records were utilized as part of a retrospective evaluation. P3 students participated in a four-part lab series on Managed Care. At the conclusion of the series, students underwent a formative PBA exercise, addressing three major topics from the Managed Care lab series. Students were divided in three sections. In section A, students received feedback from their instructor regarding counseling on prior authorizations. In sections B and C, students received feedback from only their peers for this topic. We performed this evaluation to determine if: a.) peer versus instructor feedback influenced student pass rates for the end-of-semester Managed Care (prior authorization) PBA; and b.) if students who provided feedback to their peers were more likely to pass the end-of-semester PBA. **Results:** Sixty-eight records were evaluated from Fall 2016. Twenty-one students received instructor-feedback on their prior authorization counseling while 47 received feedback from their peers. A significant difference between the likelihood of passing the end-of-semester PBA was not observed between those who received feedback from their instructor versus from a peer. Additionally,

students tasked to provide feedback to their peers (n=8) were not more likely to pass. **Implications:** In Schools or Colleges of Pharmacy looking to increase student exposure to formative performance-based assessment exercises, receiving peer versus instructor feedback did not appear to change pass rates in end-of-semester, moderate-to-high stakes performance-based testing.

**Perceived Stress, Stressors and Coping Mechanisms Among Pharmacy Residents.**

Elvira G. Zinurova, *Samford University*, Renee M. DeHart, *Samford University*. **Objectives:** The primary purpose of this study was to evaluate perceived stress in PGY-1 pharmacy residents. The secondary objective was to examine the relationship between perceived stress and certain demographic variables. Main stressors during residency training and coping mechanisms utilized by pharmacy residents were determined in this study as well. **Method:** A web-based survey (Qualtrics) was distributed among current PGY-1 residents of community pharmacy, managed care, and pharmacy practice residency programs across the U.S. The 22-item questionnaire included the 10-item Perceived Stress Scale (PSS 10), questions about demographic information (gender, age, marital status, number of children in the household, and type of residency program), number of working and sleep hours, major stressors and coping mechanisms. Statistical analyses were conducted using SPSS v. 23. **Results:** A total of 505 responses were collected. Females (70.3%) reported higher PSS-10 score compared to males (p=0.016). All age groups reported similar stress scores. Single residents (71.5%) and married residents exhibited similar PSS-10 scores (p=0.911). Residents with children (4%) had higher stress score compared to the residents without children (p=0.022). Residents in all types of residency programs reported similar PSS-10 scores (p=0.16). Number of working hours significantly affected PSS-10 score (p=0.000). Time pressures, work overload, and fear of error were the top stressors. Spending time with family and friends, staying optimistic, and engaging in enjoyable activities were the top coping strategies employed by the participants. **Implications:** The results can help pharmacy students and pharmacy residents prepare for the challenges during residency training.

**PhIT (Pharmacist-in-Training): An Electronic Portfolio to Document Students' Personal and Professional Development.**

Laurie L. Briceland, *Albany College of Pharmacy and Health Sciences*, Aimee F. Strang, *Albany College of Pharmacy and Health Sciences*, Cindy Jablanski, *Albany College of Pharmacy and Health Sciences*, Courtney Caimano, *Albany College of Pharmacy and Health Sciences*, Sandra W. Rosa, *Albany College of Pharmacy and Health Sciences*, Teresa H. Kane, *Albany College of Pharmacy and Health Sciences*, Jeffrey M. Brewer, *Albany College of Pharmacy and Health Sciences*, Sarah Scarpace Peters, *Albany College of Pharmacy and Health Sciences*. **Objectives:** The PhIT portfolio is our method of tracking student's progress with outcomes related to the personal and professional development (PPD) domains in our program. **Method:** P1-P4 students are required to upload artifacts of their involvement with and learning about various curricular and co-curricular endeavors. A predetermined list of categories guides student choice of involvement; a comprehensive list of college-sponsored co-curricular activities is also available. The electronic portfolios are housed in CoreELMS. Students use reflective practice to describe their experiences with the White Coat Ceremony, P1 Orientation, Career Fair, patient care services such as Health Expos and "Brown Bags", legislative advocacy through Lobby day, leadership through student professional organization participation and community outreach and education. Additional PhIT content includes reflections on all experiential rotations and cultivation of 16 habits of mind, and adviser- reviewed

resumes and curriculum vitae. Reflections are due at the end of each didactic year and reviewed by experiential personnel using rubrics. **Results:** All 900 students have created a PhIT portfolio. Rubric review demonstrates significant growth and achievement in meeting the Standards 2016 Domain 4 (PPD). **Implications:** Our well-developed PhIT portfolio is an effective means to track student progress and achievement of curricular outcomes related to PPD. Our methods are easily transferable to other pharmacy colleges.

**Pharmacy Curriculum Outcomes Assessment Use for Remediation Across the Academy: Results of a National Survey.**

Justine S. Gortney, *Wayne State University*, Michael J. Rudolph, *Marshall University*, Jill M. Augustine, *Mercer University*, Julie M. Sease, *Presbyterian College*, Brenda S. Bray, *Washington State University*, Nina Pavuluri, *Lake Erie College of Osteopathic Medicine*, Siu-Fun Wong, *Chapman University*. **Objectives:** To identify how Pharm.D. programs are using PCOA in assessment, identifying students "at risk," and incorporating practices for student remediation post exam. **Method:** A 39-question survey was administered to current PCOA users to identify: program characteristics and common PCOA uses, "stakes" and mechanisms used to identify deficient or poor performing students using PCOA, and the remediation policy for poor performing students. The survey was administered and stored electronically. Data were analyzed using SPSS Statistics. This research was exempted from review by the Wayne State Institutional Review Board. **Results:** Ninety-two out of 136 programs completed the survey (67.6%). The majority, 62 (75%) of 83 programs using for P3 stated "low stakes." Programs reported a variety of approaches embedded in their remediation processes including the following: cut point determination (e.g., fixed percentile, national comparison, institution specific), who identifies and monitors the remediation process (e.g., program leadership or committee-curriculum or progression), the length of the remediation (e.g., self-study or time-specific), and how assessment of remediation occurs (e.g., PCOA re-administration or program-based exam). Twenty programs (22%) required remediation for P3 students who exhibited poor PCOA performance, 6 (7%) required remediation for P1 students, 7 programs (8%) for P2 students, and 1 program (1%) for P4 students. **Implications:** Results of this survey provide information on utilization of the PCOA to identify and remediate poor performing students. A variety of remediation processes are described. The information provided can be helpful to schools and colleges who may want to change or modify their remediation processes.

**Pharmacy Resident Teaching Certificate Program Impact on Faculty Workload.**

Kali VanLangen, *Ferris State University*, Jodie L. Elder, *Ferris State University*, Lindy M. Farwig, Stephanie LaPointe, *Diplomat*, Jordan D. Posey, *Spectrum Health*. **Objectives:** Describe the Pharmacy Education Development and Lecture Series (PEDALS) program and determine impact on faculty workload of incorporating residents into a lab-based course. **Method:** Developed in 2006, PEDALS includes post-graduate year one (PGY-1) residents from 16 programs throughout Michigan. Residents participate in lectures during the fall to prepare for teaching experiences. Since 2012, residents have been incorporated into a lab-based course within the third professional (P3) year to allow for the completion of program requirements and address faculty workload concerns. Integrated Case Studies (ICS) is a 15-week lab-based course with four class sections, each meeting twice weekly. Objective Structured Clinical Examinations (OSCEs) are used to assess student skills twice throughout the course. Residents collaborate with a faculty mentor to develop course materials, facilitate classroom discussions, and evaluate students. **Results:** Annually, approximately 36 residents develop material and facilitate



the ICS course, accounting for 216 direct classroom hours per year. This decreased faculty direct classroom hours by 44%. Residents also accounted for an average of 19.5 hours (34%) of evaluation for each OSCE. **Implications:** Utilizing residents in a lab-based course has eased faculty workload concerns. Reducing workload associated with OSCEs decreases one of the primary barriers to incorporating this assessment technique into pharmacy curriculums. Informal feedback from resident surveys indicate the workshops and teachings have improved comfort in preparing classroom materials and facilitating large group discussions. Areas of future study include assessment of student and resident learning and faculty mentoring time requirements.

**Pharmacy Student Perceptions of Mobile Blood Pressure Measurement Applications.** Adam Pate, *The University of Louisiana at Monroe*, Kristen A. Pate, *The University of Louisiana at Monroe*, David J. Caldwell, *The University of Louisiana at Monroe*, Stephen R. Hill, *The University of Louisiana at Monroe*. **Objectives:** To evaluate student pharmacists' perceptions of mobile health applications ("app") after a lab activity using a mobile blood pressure measurement app. **Method:** As part of a required integrated lab activity evaluating blood pressure measurement technique, students utilized a mobile health app on an iPhone in addition to performing a manual and automated blood pressure measurement. At the conclusion of the lab students voluntarily completed a survey evaluating their perception of mobile health apps and the blood pressure app used in the lab. Surveys were completed using Google forms, and descriptive data was collected. **Results:** 87 out of 95 students (91.6%) completed the survey. 39.1% disagreed/strongly disagreed that they were comfortable with mobile health apps. A majority of students believed mobile health apps would become important (63.2%) and had used one (79%) other than in the lab. Students expressed a degree of skepticism, with 37.9% disagreeing/strongly disagreeing that they trusted mobile health apps. The three greatest perceived barriers to mobile health implementation were: connectivity/coverage gaps (66.7%), privacy and security of patient information (50.6%), and lack of information on what is available (49%). Price and complexity were perceived to be the lowest barriers. **Implications:** Pharmacy students may be utilizing mobile health apps, but likely are unprepared to advise patients on use to improve their health. These findings suggest a role for greater exposure and education in schools in order to better prepare students to guide patients' use of new technology.

**Pharmacy Student Perceptions of a Flipped Drug Information Simulation Course.** Nicole M. Maisch, *St. John's University*, Maha Saad, *St. John's University*, Laura Gianni, *St. John's University*, Tina Kanmaz, *St. John's University*, Sharon See, *St. John's University*, Samantha P. Jellinek-Cohen, *St. John's University*, Krislyn Schweiger, *St. John's University*. **Objectives:** To determine the perceptions and outcomes of a flipped model redesign of a required drug information (DI) simulation course. **Method:** An electronic anonymous survey with questions on length of time required to complete pre-lab assignments (PLA), preferences toward different PLA, and competence using DI resources was completed by P2 students. The survey took approximately 5-10 minutes to complete. Descriptive statistics were used to analyze the data. **Results:** Fifty-one students responded. Eighty-six percent agreed/strongly agreed that PLAs prepared them for weekly simulation exercises and 92% felt they were posted in a timely manner. Most students spent 0.5-1 hour/week completing PLAs, citing studying for other exams as the major barrier. Pre-recorded lectures, database tutorials and PowerPoint slides were completed "most of the time" or "always," whereas assigned readings were completed less frequently. Students agreed that pre-recorded

lectures and PowerPoint slides greatly enhanced learning and ranked these PLAs highest. Students were satisfied/very satisfied with the overall quality of pre-recorded videos including accessibility, clarity, pace, and technology. Video length was just right (51%) to somewhat long (41%), despite being shorter than traditional lectures. After the course, 96% of students felt competent in using DI resources. Almost all students felt these skills helped them with other coursework and their professional life. **Implications:** Drug Information skills require hands on application to develop familiarity with resources. A flipped model optimizes classroom time to practice these concepts. Based on student perceptions, the flipped design will be maintained, continuing pre-recorded videos and PowerPoint slides, while minimizing assigned readings.

**Pharmacy Students' Perceptions of Knowledge and Skills Gained Through Participation in Interprofessional TeamSTEPPS Training.** Amber King, *Thomas Jefferson University*, Lenzi Kerry, *Thomas Jefferson University*, Elena M. Umland, *Thomas Jefferson University*, Elena Schmidt, *Thomas Jefferson University*. **Objectives:** To assess changes in pharmacy students' perceptions of their skills relative to interprofessional teamwork before and after participating in interprofessional TeamSTEPPS training. To identify their perceptions of knowledge gained from the training and benefits of training future students. **Method:** Students (n=542) from 5 disciplines (medicine, nursing, occupational therapy, pharmacy, and radiologic sciences) attended TeamSTEPPS training. After completing online pre-work, they attended live sessions where interprofessional student teams conducted simulations requiring use of TeamSTEPPS techniques. Pharmacy students completed 8-question pre-and post-training Likert-style surveys evaluating their perceived abilities related to teamwork and communication, which were analyzed using the t-test. Additionally, pharmacy students identified specific knowledge gained and a rationale for recommending participation to future students, if applicable. Responses were thematically coded by 3 investigators. **Results:** Analysis of pharmacy student survey data (n=65) showed statistically significant increases ( $p < 0.05$ ) in (1) students' agreement that they can effectively resolve conflicts between individuals; and (2) students' disagreement with the statement that they cannot integrate information to create a plan. From the thematic analysis, students identified that they learned about new communication techniques, including strategies for speaking up on a team; the value of teamwork in healthcare; and roles of other professions. The most frequent reasons for recommending future participation included perceived benefits of engaging in interdisciplinary teamwork and practicing communication strategies emphasized in coursework. Most respondents (93%) would recommend participation to another student. **Implications:** Interprofessional TeamSTEPPS training improved pharmacy students' self-perceptions relative to their ability to effectively perform on healthcare teams, supporting continuation of TeamSTEPPS training in the curriculum.

**Piloting a Novel Interprofessional Immunization Education Simulation.** Kathryn K. Neill, *University of Arkansas for Medical Sciences*, Kristina Erbach, *University of Arkansas for Medical Sciences*, Jelena Stojakovic, *University of Arkansas for Medical Sciences*, Mari Davidson, *University of Arkansas for Medical Sciences*, Kevin Ryan, *University of Arkansas for Medical Sciences*, Michael Anders, *University of Arkansas for Medical Sciences*, Pamela DeGravelles, *University of Arkansas for Medical Sciences*. **Objectives:** To describe the design and evaluate the delivery of an interprofessional immunization education simulation. **Method:** An interprofessional simulation was designed to immerse students in the Triple Aim and concepts of

interprofessional education (IPE) through collaboration in providing immunization education. Pre-readings were provided. Interprofessional teams were divided to two tracks (1- Parent, 2 - State Senator) before interacting with standardized participants. Following the encounter, teams regrouped for a combined debriefing and completed individual post-activity evaluations consisting of self-assessments of perceptions of IPE and the simulation on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Students' perceptions about immunizations were evaluated with pre- and post-surveys using a scale of 0-10 (0=not at all, 10=most possible). Students evaluated patient/family-centered care skills, and open-response comments were solicited. Descriptive statistics are reported. **Results:** Students (n=49) from nursing, health professions, graduate school, medicine, pharmacy, and public health perceived that learning with other professional students was valuable (4.45). Students perceived the activity improved communication skills with patients/public (4.37), increased knowledge of another profession (4.45), and improved teamwork skills (4.12). Students (92%) agreed the simulation made them feel more comfortable about educating on immunizations and agreed the simulation was a valuable educational activity. **Implications:** Students perceived the simulation was effective in immersing learners in concepts of the Triple Aim and IPE and developing skills necessary to communicate effectively. Division of student teams to two tracks for SP encounters followed by combined debriefing was effective in developing communication for both scenarios.

#### **Pre- and Post-Assessments to Evaluate Student Competency in Ambulatory Care Advanced Pharmacy Practice Experiences.**

Danielle M. Miller, *Northeastern University*, Tayla Rose, *Northeastern University*. **Objectives:** To examine students' knowledge of ambulatory care practice topics before and after completion of a six-week ambulatory care advanced pharmacy practice experience (APPE). **Method:** Faculty created multiple choice questions assessing common ambulatory care topics encompassing different levels of Bloom's taxonomy and components of the Joint Commission of Pharmacy Practitioners (JCPP) Pharmacists' Patient Care Process. Questions were validated during a pilot phase. During the 2016-2017 academic year, ambulatory care APPE students completed pre- and post-assessments electronically through Blackboard. Final grades were reduced if students did not pass the post-assessment with a score of 73% or higher. **Results:** From May through December 2016, 51 ambulatory care APPE students completed both the pre-assessment (mean score of 66%) and post-assessment (mean score of 84%), with an average score increase of 44% ( $p < 0.05$ ). Five students did not pass the post-assessment. Students scored highest on the JCPP follow-up/monitor questions resulting in the lowest average score increase between pre- and post-assessments (10%). Student performance on the JCPP collect and assessment questions were similar with an average score increase of 22.1% and 19.9%, respectively. The average score increase was greatest for implement questions (mean improvement 25.7%). **Implications:** Results of the pre-assessment are useful in tailoring the APPE experience to individual student needs. Item analysis of the JCPP components identified areas where students have difficulty providing patient care and can be shared with the college's curriculum committee and faculty to ensure proper incorporation into didactic learning.

**Predictive Value of an Admissions Interview Day Calculations Assessment.** Courtney L. Bradley, *High Point University*, Christina H. Sherrill, *High Point University*, Earle W. Lingle, *High Point University*. **Objectives:** To determine the predictive value of pre-admission criteria on performance during the first semester of a four-year pharmacy program, focusing on an interview day calculations

assessment and a required one-credit hour calculations course. **Method:** Pre-admission data were gathered using PharmCAS applications and interview day assessments. Pre-admission variables included age; gender; ethnicity; race; attendance at a four-year institution; previous degree awarded; total credit hours; number of pre-admission course failures; PCAT composite, chemistry, and quantitative scores; total, pre-requisite, and math GPA; and admissions interview day calculations assessment. Post-admission data included overall first semester GPA and average percent for calculations course assessments, which were gathered using Learning Management Software and Dean's Office reports. The study was determined to be exempt by High Point University Institutional Review Board. **Results:** Data were analyzed for all students who matriculated in Fall 2016 (N=59). Eight pre-admissions factors (gender, race, PCAT composite, PCAT chemistry, PCAT quantitative, total GPA, pre-requisite GPA, and admissions interview day calculations assessment) demonstrated correlation to average percent in calculations course assessments. A multivariable regression using PCAT composite, PCAT chemistry, PCAT quantitative (highest scores), total GPA, and admissions interview day calculations assessment provided an R-squared value of 0.425 ( $p < 0.001$ ). The admissions interview day calculations assessment was not correlated to first semester GPA. **Implications:** The admissions interview day calculations assessment was positively correlated with success in a first semester calculations course but not overall first semester GPA. This assessment may prove useful in admissions decisions but could also be modified to potentially improve predictive utility.

#### **Preparing Pharmacy Students to Recommend, Prescribe and Dispense Naloxone.**

Elizabeth T. Skoy, *North Dakota State University*, Heidi Eukel, *North Dakota State University*, Jeanne E. Frenzel, *North Dakota State University*. **Objectives:** To assess the effectiveness of an educational activity designed to prepare third-year professional pharmacy students to recommend, prescribe and dispense naloxone. **Method:** In the state of North Dakota, pharmacists are given full prescribing authority for naloxone per a Board of Pharmacy protocol. Third-year pharmacy students participated in a two hour simulated laboratory activity in which they identified patients at risk for abuse or misuse of opioid medications, and then recommended, prescribed, and dispensed naloxone for those simulated patients. Students also counseled a peer on various forms of naloxone utilizing a faculty-developed consultation checklist and explored other assistive technology such as trainers and apps. Before and after the activity, students were invited to take a survey assessing their knowledge and confidence related to the recommending, prescribing, and dispensing of naloxone. A Chi Square test was utilized to determine to compare the six pre/post knowledge questions, and an independent sample t-Test was utilized to compare the mean pre/post values of the eight confidence questions. **Results:** Eighty-eight students participated in the pre-survey and sixty-one students participated in the post survey. The mean values for all pre/post questions related to students' confidence in recommending, prescribing, and dispensing naloxone showed a significant gain ( $p < 0.05$ ). The mean values for all four questions related to students' knowledge also showed a significant increase ( $p < 0.05$ ). **Implications:** A simulated laboratory activity was an effective way to increase pharmacy students' knowledge and confidence in the recommending, prescribing, and dispensing of naloxone.

**Problem-Based Learning Activity in an Advanced Pharmacotherapy Elective.** Ayse Elif Ozdener, *Fairleigh Dickinson University*, Julie Kalabalik, *Fairleigh Dickinson University*. **Objectives:** To develop and implement a problem-based learning activity (PBL) in an

advanced pharmacotherapy elective and to describe student perception of PBL and to report assessment findings. **Method:** The PBL activity was focused on pre-exposure prophylaxis in HIV. Students were divided into groups with one faculty facilitator per group. The class consisted of the PBL activity followed by an activity survey, didactic lecture, and lecture survey. Student perception of the PBL activity and lecture was evaluated using the activity and lecture surveys, respectively. **Results:** The overall response rate was 53% (17/32) in the activity survey. All students who completed the activity survey strongly agreed or agreed that the PBL activity enhanced understanding and application of the topic. The majority (87.5%) of those who responded correctly answered knowledge based question about the topic. In the lecture survey, overall response rate was 100%. The majority of students (71.8%, 23/32) strongly agreed or agreed that more PBL activities should be incorporated into didactic courses. Of 31 respondents, 96.7% (30/31) strongly agreed or agreed that a lecture was a good addition to PBL activity and improved student understanding of the topic. **Implications:** Students who completed the activity survey strongly agreed or agreed that the PBL activity enhanced understanding and application of the topic and thought that this PBL activity prepared students for APPE rotations. The majority of students strongly agreed or agreed that more PBL activities should be incorporated into didactic courses. PBL activities will be utilized in future delivery of clinical elective courses.

**Rates and Correlates of Depression in Pharmacy Residents.** Evan Williams, *Roseman University of Health Sciences*, Sarah L. Martin, *Husson University*. **Objectives:** Data regarding depression among pharmacy residents are lacking despite being at high-risk. The objective of this study was to determine the estimated rate of depression among pharmacy residents and identify correlates of depression. **Method:** We performed a nationwide online survey of pharmacy residents to gather demographic data and assess rates of depression using the validated 9-Question Patient Health Questionnaire (PHQ-9) at 3 time points throughout the 2015-2016 residency year. To identify factors correlated with depression, we used logistic regression controlling for history of depression and current use of medication for depression. **Results:** 40% [95% CI, 36.2 – 43.2] of residents reported moderate to severe depression in March 2016. Rates of severe depression increased from September to March (3.2% to 7.8%,  $P < 0.05$ ). In univariate analyses, residency-specific factors related to depression included reporting an unsupportive director/preceptor, ineffective teaching methods/unclear expectations, a poorly structured/disorganized program, not having a full day off each week, working more hours, and inpatient setting ( $p < 0.001$ ). The strongest predictors of depression were perceived stress level (OR=2.52) and not getting enough sleep (OR=2.46). In multivariate models excluding stress level and sleep, not having enough days off (OR=6.5) and inpatient setting (OR = 1.73) remain significant correlates of depression. For non-residency-specific factors, having a supportive family (OR=0.68) and having family nearby decrease odds of depression (OR=0.47). **Implications:** The rate of depression among pharmacy residents exceeds estimates for the general public and medical residents. This data may be used to help identify residents at risk for depression and to develop mitigation strategies.

**Recruitment Efforts in High Schools Using Interprofessional Role-play and Simulation.** Lawrence R. Kobulinsky, *University of Pittsburgh*, Sandra L. Kane-Gill, *University of Pittsburgh*, Pamela L. Smithburger, *University of Pittsburgh*, James C. Coons, *University of Pittsburgh*, Julie R. Mandel, *University of Pittsburgh*, Xinyan Ye, *University of Pittsburgh*, Olivia M. Marchionda, *University of Pittsburgh*,

Suzanne M. Mannino, *University of Pittsburgh*, Randall B. Smith, *University of Pittsburgh*, Amy L. Seybert, *University of Pittsburgh*. **Objectives:** To inspire high school students to pursue a career in pharmacy and encourage them to visit the University of Pittsburgh School of Pharmacy. **Method:** Faculty, staff, and PharmD students developed an interprofessional roleplay simulation where high school students assumed a pharmacist, nurse, and physician role treating a patient with chest pain. A high-fidelity human simulator was used to show realistic representations of treatment and patient response. The student playing the pharmacist assessed the patient's medical history and recommended an appropriate treatment plan. "Time-out" sessions were incorporated to provide debriefing. All high school students were asked to complete a survey to evaluate awareness of pharmacy opportunities. This experience was designed for students in advanced science/health courses. **Results:** Sixty-eight high school students at 2 high schools participated and completed the survey. Prior to simulation, 47 students responded that they did not consider a pharmacy career while 7 students said they would not consider a pharmacy career post-presentation. Sixty-four students agreed or highly agreed that the program changed their perception of what pharmacists do in practice. Sixty-one students stated that the program was effective or highly effective in educating about a pharmacy career. Thirty-five students were interested in visiting Pitt. All students responded that simulation was effective. Teachers commented that this program coincided with high school curricular learning objectives. **Implications:** Exposing high school students to pharmacy careers using interprofessional role-play simulation increases excitement about pursuing a pharmacy education and students' perception of pharmacists. This exercise can easily be duplicated by other schools to increase applicant pools.

**School of Pharmacy Student Diversity and Inclusion Climate Assessment.** Lakesha M. Butler, *Southern Illinois University Edwardsville*, Robyn Berkeley, *Southern Illinois University Edwardsville*. **Objectives:** To quantitatively and qualitatively assess the school of pharmacy's campus climate regarding diversity and inclusion according to pharmacy students. To determine areas of improvement for the school of pharmacy (SOP) climate related to diversity and inclusion. **Method:** An anonymous survey containing likert-type and open-ended questions was created to measure the campus climate regarding diversity and inclusion as a part of the University's Institutional Diversity plan. All P1-P4 students were requested to participate in the climate survey via an email link through Qualtrics. IRB approval was obtained. The survey remained open for 2 weeks. **Results:** 215 out of 319 total pharmacy students completed the climate survey (P1=62; P2=78; P3=68; P4=7. For the likert-scale positive questions (1-lowest to 5-highest) the majority scored an average of 4 or greater. Survey questions pertaining to the visibility of diversity efforts at the SOP and diversity efforts being a priority at the SOP scored an average of less than 4. The majority of qualitative comments were positive pertaining to the impact of promoting diversity and most students felt that no improvements were needed for the diversity climate. **Implications:** The current campus climate is good according to most students. Students feel comfortable at the school and in the classroom. The school developed a diversity and inclusion committee charged with developing a diversity plan for the school. With the implementation of the plan, diversity and inclusion efforts will become more visible and as a priority. The campus climate survey will be administered every 3 years to for continuous assessment.

**Screening, Brief Intervention, and Referral to Treatment (SBIRT) Health Care Interprofessional Training Program.** George E. Downs, *University of the Sciences*, Daniel J. Ventricelli, *University*

of the Sciences, Joan Ward, *University of the Sciences*, Kyle O'Brien, *University of the Sciences*, Janice Pringle, *University Pittsburgh*, Cathy Y. Poon, *University of the Sciences*. **Objectives:** The objective of the Screening, Brief Intervention, and Referral to Treatment (SBIRT) curriculum was to train healthcare students and faculty using an innovative and evidence based strategy. **Method:** The Substance Abuse and Mental Health Service Administration (SAMHSA) awarded a multiple disciplinary grant to support this training program. The SBIRT curriculum was integrated into a substance use disorder (SUD) course for pharmacy and physician assistant students and included self-directed online activities, in-person workshops, and clinical experiences. Students were administered a Survey of Attitudes and Perceptions prior to and upon completion of training. These matched surveys assessed changes in core knowledge, perceived competency, attitudes and perceptions. Qualitative data was derived from post-training focus group discussions and interviews with key informants. A brief Clinical Encounters survey was sent to trainees to gauge effectiveness and adoption of SBIRT in clinical practice. **Results:** 111 pharmacy and 39 physician assistant students completed the training program. Results indicated improvement from pre-training to post-training in core knowledge and student self-reported attitudes, perceptions and competence in SBIRT. Clinical encounter reports and qualitative data indicated students found SBIRT to be an effective tool, however, time may be a barrier to its application in clinical practice. **Implications:** Effectively training healthcare professional students to identify and address SUDs among patients using an evidenced-based method for screening and intervention will help address the growing national concerns of drug overdose deaths and other effects of harmful alcohol and drug use. The goal is to have trainees utilize SBIRT throughout the healthcare community.

**Simulation as a Central Feature of an Elective Course. Does Simulated Bedside Care Impact Learning?** Michael Thomas, *Samford University*. **Objectives:** The primary objective was to determine if there was a difference in exam performance stratified by student experience. The secondary objective was to report student satisfaction. **Method:** This was a 3-credit, simulation-based, emergency medicine elective course offered to doctor of pharmacy students. Each week, students were exposed to both lecture and simulation activities. Examination questions covered in both simulation and lecture were used for the analysis (37-74% of each examination depending on the year and midterm or final). Each student was assigned to either the evaluation team or clinical team each week, but these experiences alternated so every student had similar exposure to each role. Examination performance for simulation-based questions was compared based on the student role (evaluator vs. clinical) using the Student's t-test. Summary responses from Likert scale-based student satisfaction responses were collected. This investigation was approved by the institutional review board. **Results:** This report summarizes two years of experience with the course. A total of 24 students took the course, 12 in each offering. Performance was similar whether the student was assigned to the evaluation team or clinical team for all comparisons (midterm and final 2015 and 2016, all p-values >0.05). Students were very satisfied with the course. Of the 19 questions assessed, all students agreed or strongly agreed to 17 statements and all students were neutral, agreed, or strongly agreed to the remaining 2 statements. **Implications:** This study supports this course design which allows for both direct participation and observation as valuable contributors to learning.

**Status of Scholarship of Teaching and Learning (SoTL) in US Colleges and Schools of Pharmacy.** Mohammed A. Islam, *West Coast University*, Reza Taheri, *West Coast University*, Rahmat

M. Talukder, *The University of Texas at Tyler*, Sarah McBane, *University of California, San Diego*. **Objectives:** To determine the status of pharmacy faculty engagement in the Scholarship of Teaching and Learning (SoTL) and its institutional recognition. **Method:** A survey instrument was distributed through SurveyMonkey to faculty members of US Schools/Colleges of Pharmacy. Survey items solicited information on faculty SoTL practices and institutional awareness and recognition of SoTL. Descriptive statistics were utilized for data analysis. **Results:** A total of 638 faculty representing 100% of ACPE accredited schools and colleges of pharmacy participated in the study. While, 73% percent of respondents indicated that they were engaged in SoTL, 59% reported publication of manuscripts in this area. A total of 1532 manuscripts and 2420 conference abstract publications were reported. About 65% of faculty members involved students in their projects. Only 6% of respondents indicated receiving external funding, while 20% indicated receiving internal funding for their SoTL projects. The *American Journal of Pharmaceutical Education* and the *Currents in Pharmacy Teaching and Learning* were the top two journals, where 80% and 62% of respondents published their works. Institutional acceptances of SoTL as criteria for promotion and merit-based salary increase were indicated by 72% and 40% respondents, respectively. **Implications:** SoTL is a growing area of concentration for scholarly pursuits of pharmacy faculty. An institutional commitment to pharmacy education with recognition of values of SoTL is vital to engage many faculty members in this practice. Our findings should serve as an impetus for inclusion of SoTL productivity in institutional reward structure.

**Student Ability to Recommend Self-Care Therapies Before and After Addition of a Didactic Nonprescription Therapeutics Course.** Alan P. Moyer, Michael A. Hegener, *University of Cincinnati*. **Objectives:** To determine if a didactic course or performance-based laboratory modules better prepare students to confidently recommend appropriate self-care therapies. **Method:** Prior to addition of a required, didactic nonprescription therapeutics course to the curriculum, self-care topics were taught as a set of performance-based modules in a skills laboratory. The didactic course replaced these modules. Student performance on a standardized capstone exam was assessed both before (classes of 2012 and 2014) and after (classes of 2016 and 2018) addition of the didactic course. The exam required students to utilize the QuEST process to recommend appropriate self-care treatments. In addition, a survey to assess student confidence in making recommendations for various self-care conditions was administered both before (class of 2012) and after (class of 2018) addition of the didactic course. **Results:** Performance for 366 students was analyzed (174 prior to addition of the course and 192 after). Students who were taught self-care via skills laboratory modules scored significantly higher overall than those who participated in the didactic course (90.1% vs. 84.9%,  $P < 0.001$ ). However, students in the didactic course were significantly better at determining when patients had exclusions to self-care treatment (95% vs. 92.3%,  $P < 0.01$ ). The class of 2012 was more confident in making recommendations for 85% of the self-care conditions listed on the survey than the class of 2018. **Implications:** Teaching self-care via performance-based modules instead of as a didactic course may lead to better student outcomes with regards to perceived confidence and ability to recommend appropriate self-care treatments.

**Student Analysis of Antiretroviral Prescriptions for Patients With HIV Infection.** Brandon Green, *University of Maryland Eastern Shore*, Richard A. DeBenedetto, *University of Maryland Eastern Shore*. **Objectives:** Determine whether students perform better when

evaluating HIV antiretroviral (ART) regimens receiving the medications one at a time (SingleRx) or all at once on a single prescription paper (MultiRx). Also determine which analysis method students preferred and if they performed better when working with that method. **Method:** Fifty three UMES pharmacy students completed an educational activity where they evaluated ART regimens based on the SingleRx vs. MultiRx styles. Students were responsible for determining a regimens appropriateness, completeness, and issues like drug interactions or contraindications. Students selected correct regimens, then were asked to indicate which method they preferred on the paper assignment. **Results:** We analyzed only those who completed the entire exercise. SingleRx showed a statistical difference between correct vs. incorrect answers ( $P = .008$ ) while MultiRx did not ( $P = .244$ ). Statistical differences were seen in the number of correct answers (SingleRx vs. MultiRx,  $P = .010$ ). Students performed better when evaluating regimens one prescription at a time, which did not match overall student preference (6 preferred SingleRx and 47 preferred MultiRx). **Implications:** ART is currently evaluated a single prescription at a time in pharmacies yet students overwhelmingly prefer a multiple-prescription evaluation. Our results showed that students performed better when given one prescription at a time, however limitations have prompted a new study design that attempts to remove confounders. Continued data collection may show which style is easier for students to interact with and which could lead to a more robust evaluation of ART.

**Student Attitudes Following an Interprofessional Activity on Cultural Competence for Pharmacy and Social Work Students.** Nancy Borja-Hart, *The University of Tennessee*, Sharon McDonough, *The University of Tennessee*, Kate Chaffin, *University of Tennessee, Knoxville College of Social Work*, Ragan Schriver, *University of Tennessee, Knoxville College of Social Work*. **Objectives:** To determine whether pharmacy and social work student attitudes changed following an IPE activity as measured by the Interprofessional Attitudes Scale (IPAS). **Method:** Third-year pharmacy students ( $n = 160$ ) and social work students ( $n = 28$ ) participated in a 2-hour case-based IPE focused on cultural competence. The IPAS, a 45-item validated survey measuring agreement with IPE statements on a 7-point Likert scale, was administered via Qualtrics and analyzed using SPSS (Version 22). Descriptive statistics were summarized. The Wilcoxon Signed Rank Test was used to compare pre- and post-curriculum responses. **Results:** Eighty-nine students (47%) completed pre- and post IPE surveys (Pharmacy:  $n = 85$ , Social Work:  $n = 4$ ). Student attitudes towards teamwork, roles, and responsibilities were positive in relation to increasing my ability to understand clinical problems ( $p = 0.001$ ), thinking positively about other professionals ( $p = 0.004$ ), communicating better with patients and other professionals ( $p = 0.005$ ), and working on small group projects with them ( $p < 0.001$ ). Positive attitudes towards community-centeredness were also noted with statements about promoting community and public health ( $p = 0.031$ ), and focusing on populations and communities to deliver effective health care ( $p = 0.043$ ). Three statements that are new from the original IPAS survey with positive findings are team members should learn about best practices in order to work together effectively ( $p = 0.011$ ), accept and embrace differences to provide quality care ( $p = 0.041$ ), and All members should participate in quality improvement efforts ( $p = 0.041$ ). **Implications:** Overall, responses reflected positive attitudes towards IPE and practice. Next steps include an OSCE or written exam to assess IPE skills in addition to the IPAS.

**Student Participation in Group Oral Examinations Following Implementation of an Individual Component.** Nathan A. Pinner, *Auburn University*, Mary K. Stuart, *Auburn University*, Natalie Tapley,

*UAB Hospital*, Kristen L. Helms, *Auburn University*. **Objectives:** The Integrated Pharmacotherapy sequence at Auburn University Harrison School of Pharmacy utilizes group oral examinations as part of the assessment package for the course. This method allows us to assess in a manner authentic to the problem-based learning method employed in this course. Grading of these examinations identified students that were underprepared to contribute to the group defense of their therapeutic plans. To reduce the ability of students to be supported by peers we instituted an individual assessment prior to the group examination. We sought to characterize the impact of these changes on the group dynamics during the examination. **Method:** Two investigators independently reviewed recorded oral presentations from Fall Semester 2015 to determine the frequency of “rescues” and “no responses” per team. A rescue was defined as any objection following the initial response that substantially changed or opposed the original answer, where a no response was any instance where the student failed to answer. **Results:** A total of 30 examinations were reviewed (18 in Phase 1 and 12 in Phase 2). A mean of 4.11 versus 3.75 rescues per team [ $P = 0.52$ ] were observed for Phase 1 and 2, respectively. No responses were uncommon, but were less frequent in Phase 2 (0.08/team) than in Phase 1 (0.4/team). **Implications:** Student participation appears to be improved, but the differences are small and need further evaluation to conclude that students are better prepared for the examinations.

**Student Perception of Game-Based Active Learning Strategies in Infectious Diseases.** Lauren R. Biehle, *University of Wyoming*, Meghan N. Jeffres, *University of Colorado*. **Objectives:** The ACPE 2016 Standards 3 and 4 dictate that a pharmacy program needs to focus on problem-solving, communication, and innovation. Game-based active learning addresses many of these key elements and promotes practice-readiness. The objective of this study was to determine student-perceived differences in multiple active learning strategies. **Method:** Third and fourth year pharmacy students were invited to participate in six active learning strategies using infectious diseases content. These game-based strategies included audience response (Kahoot), simulation (Septris), problem-based learning (Carmen STD-go), a card game (BugOut!), a board game (Chutes and Ladders), and a quiz game (Catchphrase). Students were then asked to complete a survey for each game. **Results:** 41 students participated. Using a Likert scale from 1 to 10, (1=lowest value, 10=highest value) students ranked the educational value of each game. The mean scores for each game were Chutes and Ladders 8.58, Kahoot 7.24, Catchphrase 7.07, Septris 6.71, Carmen STD-go 6.20, and BugOut! 6.20. The mean scores of how likely students were to use the game as a study tool were Chutes and Ladders 6.92, BugOut! 6.50, Septris 5.51, Catchphrase 5.41, Kahoot 4.39, and Carmen STD-go 3.66. The percent of students that would recommend adding each game to the curriculum was 92.7% for Catchphrase, 87.8% for Chutes and Ladders, 82.9% for Kahoot, 78.0% for Carmen STD-go, 68.3% for Septris, and 61.0% for BugOut!. **Implications:** No single game-based active learning strategy was preferred in the categories of educational value, utility as a study tool, and recommendation for inclusion into the curriculum.

**Student Perception/Knowledge Regarding Naloxone for Opioid Overdose Before and After a Required Training Module.** Sanjeewa A. Goonasekera, *University of Cincinnati*, Patricia R. Wagle, *University of Cincinnati*, Michael A. Hegener, *University of Cincinnati*. **Objectives:** The objective of this project was to evaluate student perception and knowledge about dispensing naloxone for opioid overdose before and after a required training module. **Method:** Prior to the training module, third professional year students were given a brief

survey that assessed their perception of pharmacists' authority to dispense and counsel on naloxone use (14 questions), as well as knowledge about naloxone (10 questions). The module consisted of a 90 minute, hands-on training session with teach back method used to assess competence in counseling and demonstrating the administration of different naloxone formulations. At the end of the module, students were asked to complete post-module surveys which included the same questions as the pre-module survey. **Results:** Eighty-one pre- and 91 post-module surveys were completed. Mann-Whitney U tests were used to analyze the perception data. Students showed significantly higher ( $p < 0.05$ ) positive perception in the post-module surveys when asked if pharmacists should dispense naloxone to persons at risk of opioid induced overdose (4.3 vs 4.6), in their comfort levels to recognize signs and symptoms of opioid overdose (3.6 vs 4.7) and in their ability to identify persons at risk of opioid abuse induced overdose (2.9 vs 4.3). Students scored an average of 68.8% and 77.3% on the pre- and post-module surveys, respectively. **Implications:** A learning module dedicated to train pharmacy students the appropriate procedures involved in naloxone dispensing and counseling enhanced student perception and knowledge which better prepared them to contribute in potentially lifesaving circumstances.

**Student Perceptions and Confidence Pre and Post EHR Implementation in an Institution Based Pharmacy Skills Lab.** Amy Ives, *University of Maryland*, James A. Trovato, *University of Maryland*, Shannon R. Tucker, *University of Maryland*. **Objectives:** To measure student confidence regarding inpatient medication order processing after implementation of EHR technology. To measure student perception of EHR technology to facilitate data collection for SOAP note writing. **Method:** Pre and post implementation surveys were administered during regular class time to second year (P2) doctor of pharmacy students enrolled in the institution-based skills laboratory course, and responses were paired. Survey items were grouped into four sections including: background information, confidence in order processing skills, confidence in data collection for the purpose of writing a SOAP note and opinions regarding EHR technology. Confidence and opinion questions were evaluated on a 5 point Likert scale. Open ended questions were used for course improvements. Statistical significance was measured by the Wilcoxon signed-rank test. **Results:** Pre and post-survey paired data was available for 108 students. The majority of students had retail experience (75.8%) and 55.6% of students had no prior exposure to EHR technology. There was a statistically significant difference in student confidence regarding inpatient medication ordering skills ( $p < 0.0001$ ). There was also a statistically significant difference in student confidence regarding the ability to collect information to write a SOAP note ( $p < 0.0001$ ). Approximately one-third of students either somewhat agree or strongly agreed that the EHR technology should continue in future years (28.7%, 29.6% respectively). **Implications:** Exposure to EHR technology improved student confidence in their ability to process inpatient medication orders and collect relevant information for writing a SOAP note. These findings support the continued use of an EHR platform in skills-based activities.

**Student Perceptions of Course Introduction Using Novel Technology.** Jennifer W. Beall, *Samford University*, Angela R. Thomason, *Samford University*, Peter J. Hughes, *Samford University*. **Objectives:** To assess students' perceptions of online videos using green screen technologies as a method to introduce course information in two multiple-section laboratory courses. **Method:** This cross-sectional research employed the use of a post-exposure, 11-item survey. The videos were developed using green screen technology. One video

covered pertinent course and syllabus information. The second video outlined the schedule and descriptions of activities. The videos ranged in length from 11 to 14 minutes and were posted to an online course management system. Students were asked to complete an anonymous electronic survey after viewing. The survey contained demographic information and seven Likert scale questions. IRB approved the study. **Results:** A total of 127 students (53% response rate) completed the survey ( $n=66$  second year;  $n=61$  third year). The majority of participants in both classes were female and average age ranged from 20-25 years of age. The majority of second- and third-year students agreed that online video was an acceptable substitute for face-to-face course introduction. Forty-eight percent of third-year students preferred online course introduction compared to 21% of second year students. Of those, the main reasons were ability to view at one's own pace and ease of scheduling their viewing time of the video. However, more second year students valued the ability to ask questions during a face-to-face interaction compared to third-year students (62% versus 41%, respectively). **Implications:** Online course introductions maybe an acceptable substitute for face-to-face introductions with some limitations.

**Student Perceptions of Pharmacy Faculty and Preceptor Attributes.** Therese I. Poirier, *Southern Illinois University Edwardsville*, Junvie Pailden, *Southern Illinois University Edwardsville*, Emily McMahill, *Southern Illinois University Edwardsville*. **Objectives:** Compare students' perception of valued attributes among pharmacy faculty to similar attributes among APPE preceptors. **Method:** An online survey created using a validated instrument, build-a-teacher task, that measures 9 widely valued teacher qualities. The students were tasked with designing the ideal teacher by buying qualities with a limited budget of \$20. The purchasing scale ranged from \$0 to \$10 per attribute. Students during the end of the P3 year were asked to pick qualities they value in pharmacy faculty. During the mid-way portion of P4 APPE the same students were asked to pick qualities they value in pharmacy preceptors. Repeated measures MANOVA test was conducted to test for differences in the qualities between the P3 and P4. ANOVA test was then used to determine which qualities changed significantly;  $P \leq .006$  needed for statistical significance after Bonferroni adjustment. **Results:** Forty-three matched data pairs were obtained which represented 57% of surveyed students ( $n = 75$ ). A significant multivariate difference in the desired teacher quality scores was detected between the P3 and P4 years. Closer inspection reveals that three quality traits differ significantly: clear presentation style, topic expertise and good feedback. For the first two traits during the P4 year these were less valued and for the third traits it was more valued than during the P3 year. **Implications:** It appears that one of the key qualities that is highly valued even more during experiential education is good feedback. This reaffirms the need for preceptor training on providing feedback.

**Student Perceptions on Interprofessional Collaboration Through Non-Simulated, Geriatric Outreach Community Programs.** Paula J. Evans, *MCPHS University-Worcester/Manchester*, Christine Dominick, *MCPHS University-Worcester/Manchester*, Cheryl Babin, *MCPHS University-Worcester/Manchester*, Constance Inacio, *MCPHS University-Worcester/Manchester*, Lorraine MacDonald, *MCPHS University-Worcester/Manchester*, Amy Falk, *MCPHS University-Worcester/Manchester*, Heather Fusco, *MCPHS University-Worcester/Manchester*, Sarah Willey, *MCPHS University-Worcester/Manchester*. **Objectives:** To describe interprofessional community health education activities with older adults and to assess student perceptions towards health care teams in the setting of the community

programs. **Method:** Students at the university from pharmacy, dental hygiene, physical therapy, optometry, and nursing provided programs for older adults at a community outreach living facility. A different health program was offered each semester and included patient education and discipline-specific screening sessions. Student teams evaluated the older adults and minimal instruction was given to students regarding execution of their evaluations. Anonymous surveys were administered to students immediately before and after each program using the 18-item Interdisciplinary Education Perception Scale (IEPS) questionnaire. A faculty-student debriefing session followed each program. **Results:** Three programs were provided and focused on hypertension, nutrition, and general health/falls. Sixty-four students participated in the pre/post survey and responses of all participants prior and after health education programs were combined. Following completion of the programs more students believed “individuals in my profession are able to work closely with individuals in other professions” (mean response 5.58 vs 5.81,  $p = 0.001$ ), “individuals in my profession must depend upon the work of people in other professions” (mean response 5.08 vs 5.37,  $p = 0.001$ ) and “individuals in my profession think highly of other related professions” (mean response 5.25 vs 5.54,  $p = 0.004$ ). Significant differences were noted in 83% of the survey questions. **Implications:** Health professional students participating in a non-simulated health care event indicate they understand the benefits of working collaboratively.

**Student Perspectives of a Media News Story Evaluation Assignment in a Large Classroom Workshop Setting.** Kathleen Vest, *Midwestern University/Downers Grove*, Brooke Griffin, *Midwestern University/Downers Grove*, Spencer E. Harpe, *Midwestern University/Downers Grove*, Danielle Pham, *Midwestern University/Downers Grove*. **Objectives:** To evaluate pharmacy students’ abilities and confidence with assessing health-related media news stories after completion of a required workshop activity. **Method:** Third year students ( $n = 178$ ) enrolled in a mandatory Therapeutics course were required to read one journal article and one corresponding media news story to address a proposed scenario involving a patient request for information regarding the accuracy of the news story. Prior to workshop, half of the students utilized a rubric to fact check the news story while the other half wrote a patient response. During workshop, students worked on the opposite approach. After completing individual assignments, students worked in small groups to discuss their news stories and compile one patient response. Students were asked to complete an optional electronic survey after completion of the workshop. **Results:** A response rate of 85% was attained. The mean (SD) score was 11.07 (0.73) out of a possible 12 points (92%). Most students agreed or strongly agreed that this workshop increased their knowledge of criteria to look for when evaluating news stories (89%) and helped them understand the importance of assessing news stories for accuracy and potential bias (89%). Additionally, 82% of students reported they are confident in their ability to communicate with patients about news stories after completing the workshop. The approach of fact checking first was most valuable in evaluating news stories (56%). **Implications:** Students performed well on the media evaluation workshop and found it beneficial. Incorporating activities involving news story fact checking may help prepare students for scenarios commonly encountered in practice.

**Student Pharmacists’ Perceptions of Transgender Health Management.** Caitlin Leach, Cherokee Layson-Wolf, *University of Maryland*. **Objectives:** 1) To measure the general perceptions and attitudes of student pharmacists’ toward transgender patients and health; 2) to evaluate students’ level of support for receiving education in transgender

healthcare. **Method:** This study was a cross-sectional survey delivered online to approximately 60 P2 pharmacy students enrolled in the PHAR 5006 AST 6: Endocrine, Women’s Health, and Genitourinary course at the University of Maryland School of Pharmacy in Baltimore, MD. Students received a SurveyMonkey link presented via a PowerPoint slide with 5 questions for completion prior to the “Gender Transition Therapeutics” lecture and a separate link with 11 questions for completion post-lecture. Responses were anonymous with no identifiers collected on the survey. Survey responses used multiple-choice, Likert-scale questions aimed at gathering respondents’ perceptions of managing transgender patients and support for receiving additional education in transgender healthcare. **Results:** The results of the survey indicated that students’ cultural competency and confidence in managing transgender patients improved after lecture, and that they support integrating transgender health into pharmacy education. Significant findings include: 67% of students lacked confidence in their ability to treat transgender patients prior to the lecture while only 20% of students reported this lack after the lecture. 51% of students reported being aware of barriers-to-care experienced by the transgender population compared to 92% of students after the lecture. After the lecture, 87% agree pharmacists need more education in transgender health, and 74% support integrating this education into pharmacy curricula. **Implications:** Transgender health education should be integrated into pharmacy school curricula and continuing-education programs.

**Student Pharmacist’s Competencies Achieved During a Pilot Co-Curricular Training Program in Precision-Based Behavioral Medicine.** Thomas C. Dowling, *Ferris State University*, Michael Reger, *Ferris State University*, Brooke Roff, *Robertson Research Institute*, Stephen W. Durst, *Ferris State University*, Joel Robertson, *Robertson Research Institute*. **Objectives:** To evaluate competencies among student pharmacists enrolled in a structured training program focusing on behavioral medicine offered by the Robertson Research Institute (RRI). **Method:** Students in the 3rd professional year elected to participate in a Behavioral Medicine Assistant (BMA) and a Specialist (BMS) Training program, both designed as a combination of didactic, case-based and RRI-mentored experiential activities. Student pharmacists completed pre- and post-test assessments during the course of the 24-hour program, targeting 7 key content areas including cellular physiology, behavioral medicine, diabetes education, genetics, neurobehavior, neurophysiology, and neuropharmacology. Competencies were measured on a 5-point Likert scale. Higher scores indicate stronger understanding of behavioral medicine content. Pre- and post-BMA and BMS scores were compared by Wilcoxon matched-pairs signed rank using SPSS. **Results:** 17 students completed the BMA and 12 students continued into the BMS program. Competency scores showed a significant overall improvement ( $p < 0.0001$ ) from pre-BMA ( $3.1 \pm 1.1$ ) to post-BMA ( $4.5 \pm 0.6$ ). Each of the 7 content dimensions showed significant improvements ranging from 1.2 to 1.8 out of 5 ( $p < 0.0001$ ). Students completed the BMS personal strategic plan assessments with scores of  $98\% \pm 3\%$ . **Implications:** Student pharmacists demonstrated BMS competencies following completion of an innovative 24-hour co-curricular program in behavioral medicine. High baseline BMA scores ( $> 3.0$ ) likely reflect benefit from professional program content in pathophysiology and neurology therapeutics. These preliminary findings suggest that a co-curricular program in behavioral medicine, using an accelerated delivery format, prepares students for an innovative practice opportunity in behavioral personalized medicine.

**Student Self-Assessment of Communication Anxiety for Patient Counseling.** Daniel J. Hansen, *South Dakota State University*, Alex

W. Middendorf, *South Dakota State University*, Surachat Ngorsuraches, *South Dakota State University*, Kaya Borg, *South Dakota State University*, Sarah Ginsbach, *South Dakota State University*. **Objectives:** Evaluate the speech anxiety and communication apprehension of P1 students via standardized surveys while learning and demonstrating patient counseling skills. **Method:** A total of 77 P1 students were asked to take two surveys, the Personal Report of Communication Apprehension (PRCA-24) and Personal Report of Public Speaking Anxiety (PRPSA), to assess speech anxiety and communication apprehension. The surveys were administered three different times, first following the initial introduction of the videotaped patient counseling exercise (baseline), again after practicing with a partner over two lab periods, and finally following the high stakes assessment. Students were also asked to provide demographic information and describe previous exposure to speech training. ANOVA with repeated measures were used to compare the PRCA-24 and PRPSA scores across the three administrations and multiple linear regression analyses were used to examine factors affecting any change. **Results:** The PRCA-24 and PRPSA scores dropped significantly from the baseline administration of the survey to the final measurement (PRCA-24 – 67.91 to 63.93, p-value of <0.001; PRPSA – 108.39 to 106.23, p-value of <0.001). Age, gender, number of hours of practice, and previous speech experience were not associated with the change in either the PRCA-24 or PRPSA score. **Implications:** The level of speech anxiety and communication apprehension of P1 pharmacy students decreased from baseline to the completion of the high stakes assessment. Since age, gender, number of hours of practice, and previous speech experience did not affect this change, this may validate the current instructional methods, but further study is needed to examine the cause of this impact.

**Student and School-Level Predictors of Pharmacy Residency Attainment.** Kayley M. Lyons, *University of North Carolina at Chapel Hill*, Jacqueline McLaughlin, *University of North Carolina at Chapel Hill*, Danielle A. Taylor, *American Association of Colleges of Pharmacy*, Lana Minshew, *University of North Carolina at Chapel Hill*. **Objectives:** The purpose of this study was to identify student- and school-level predictors of pharmacy residency attainment. **Method:** Data were collected from the American Association of Colleges of Pharmacy (AACCP) and the Carnegie Classification of Institutions of Higher Education. Logistic multilevel modeling was used to examine the effects of select student- and school-level characteristics on pharmacy residency attainment, as indicated by students on the AACCP Graduating Student Survey (GSS) from 2013 to 2015. The dependent variable was residency attainment, which was coded as “yes” for students who indicated that they were continuing on to a residency program (n = 6,543) and “no” for all others (n = 17,808). **Results:** The dataset included 24,351 graduating pharmacy students from 101 schools and colleges of pharmacy (institutional response rate 80.8%). The results of the full MLM indicated that the odds of attaining a residency were 1.49 times higher for females than males, when controlling for all other variables in the model (p<.01). Other student-level predictors of residency attainment included working in an institutional pharmacy, and student age. School-level predictors included school age and Research I Carnegie Classification. Nonsignificant variables included curriculum type (traditional or accelerated), class size, and institutional control (public or private). **Implications:** Various individuals, including students, educators, and employers, have a vested interest in understanding postgraduate outcomes, and more specifically, residency attainment in the health professions. Further research is needed to understand the mechanisms associated with the effects identified in this study.

**Student-Led Cardiopulmonary Resuscitation Education to Lay Providers Results in Successful Knowledge Acquisition and Skill Performance.** Haley L. Kavelak, *University of the Sciences*, James M.

Hollands, *University of the Sciences*, Angela Bingham, *University of the Sciences*. **Objectives:** To assess outcomes associated with student-led cardiopulmonary resuscitation (CPR) education to lay responders as measured by knowledge acquisition and performance of CPR skills. **Method:** Healthcare students (87% pharmacy) were trained as American Heart Association (AHA)-certified CPR instructors. With faculty oversight, these students offered CPR certification programs for the community through the AHA’s Heartsaver CPR/Automated External Defibrillator (AED) certification course from August 2016 to January 2017. Knowledge acquisition was evaluated using 5 pre-/post-course questions adapted from the AHA Heartsaver CPR/AED written examination. Skill performance was evaluated using the AHA’s standardized form for adult, child, and infant CPR assessment after education and skills practice. **Results:** The majority of community member participants (N=105) were female (71%), African American (71%), 45-64 years of age (46%), employed (71%), college educated (50%), and had previously completed CPR training (63%). Participants demonstrated 100% success rate in correctly performing CPR skills. The mean percentage of correct responses increased from 36% for the pre-course questions to 85% for the post-course questions (p<0.001). **Implications:** Healthcare students were able to successfully provide CPR education to community members. Community members completing this student-led CPR education correctly demonstrated adult, child, and infant CPR skills. Quantitative data suggests that student-led CPR training has a positive impact on knowledge acquisition in community members in an urban setting. This student-led service learning initiative will continue to expand community outreach efforts to equip bystanders with the knowledge and skills to perform high-quality CPR in response to out of hospital cardiac arrest emergencies.

**Students’ Level of Confidence With Oncology Curricular Competencies.** Alison P. Duffy, *University of Maryland*, James A. Trovato, *University of Maryland*. **Objectives:** The purpose of this study is to assess 1st year doctor of pharmacy students’ level of confidence in performing various oncology-related competencies prior to and following the administration of oncology content in the doctor of pharmacy curriculum. **Method:** All P1 students enrolled in the Applied Science and Therapeutics (AST) oncology module were asked to complete a voluntary survey, prior to and immediately following the completion of the module. The survey evaluated prior oncology work, research, and patient care experience, prior course work, level of interest in oncology pharmacy, and students’ perceived confidence to perform thirteen oncology-related competencies. Students were asked to rate level of confidence via a Likert Scale (unclear, low, general, moderate, knowledgeable, independent). Descriptive statistics were used to describe the data. **Results:** 49 and 19 of 148 students completed the pre-assessment and post-assessment surveys respectively. Compared to the pre-assessment survey, post assessment survey responses trended towards a higher level of confidence. There was an increase in the number of students who responded moderate-knowledgeable confidence for all competencies. Additionally, the number of students who reported ‘unclear’ confidence dramatically decreased. **Implications:** The results of this survey will be used to assess potential changes to the current oncology content in the doctor of pharmacy curriculum. Future studies will be conducted to better link pre and post survey responses based on individual students. Additionally, studies will focus on evaluating students’ level of confidence after completing didactic and experiential oncology related learning and will evaluate how perceived competencies change.

**Students’ Perceptions of Preparedness for Using Electronic Medical Records Pre-Completion of Advanced Pharmacy Practice Experiences.** Sweta M. Patel, *Mercer University*, Kathryn M. Momary,



*Mercer University*, Gina J. Ryan, *Mercer University*. **Objectives:** The use of electronic medical records (EMRs) can potentially help the transition from classroom to clinical practice. The purpose of this study was to assess if previous exposure to an EMR can increase the feeling of preparedness for students prior to the start of their advanced pharmacy practice experiences (APPEs). **Method:** The paper survey included 17 questions and was administered at the end of the third professional year to the students who provided written informed consent. The majority of questions were 4-point Likert-scale type questions, ranging from extremely prepared to extremely not prepared, that evaluated students' preparedness and confidence to complete clinical tasks in an EMR. The remaining questions assessed previous EMR exposure and asked open-ended questions regarding preparedness. Data were compared between students with previous EMR exposure and those without. Chi squared test and Wilcoxon-signed Rank test were utilized to evaluate categorical and ordinal data, respectively. **Results:** Seventy-four percent of the students completed the survey. Ninety-six of these students reported using EMR either during their institutional introductory pharmacy practice experiences or as interns. Compared to non-EMR exposed students, students who had some EMR exposure felt more prepared in their ability to use EMR to collect pertinent patient-specific information ( $p=0.003$ ) and document treatment recommendations ( $p=0.002$ ). Additionally, students exposed to EMR expressed more confidence ( $p<0.0001$ ) in their ability to use EMR during their APPE rotations. **Implications:** Third year professional students with some prior exposure to EMR felt more prepared and confident to utilize EMRs to effectively provide patient care.

**Success of an Elective Course in Preparing Pharmacy Students for the Application Process of PGY1 Residencies.** Tibb F. Jacobs, *The University of Louisiana at Monroe*, Jamie Terrell, *The University of Louisiana at Monroe*, Dharti Desai, *The University of Louisiana at Monroe*. **Objectives:** Attaining a post-graduate residency position is becoming more difficult due to an increasing number of applicants versus residency positions. The objective was to assess students' perceived preparedness during the application process and the likelihood of obtaining a residency position after taking a preparatory elective. **Method:** After attaining approval by the university's IRB, a survey of 18 questions was emailed to 63 alumni who participated in the elective course from 2011 to 2014. The survey asked multiple choice and open-ended questions about feelings of preparedness on several topics, as well as their success in the PGY1 application process, including number of applications submitted and interviews attained. **Results:** Data collected were reported using descriptive statistics. Of the 40 students that participated in the survey, 24 students applied for a PGY1 residency and of those students 83.3% were successful in the first match. Ninety-two percent of students felt very/extremely prepared in composing a CV. Eighty-three percent of students felt very/extremely likely the mock interview exercise improved their interviewing skills, and 70% felt very confident during the interviewing process. Approximately 87.5% of all residency-seeking students would be very/extremely likely to recommend this class to others with similar interests. According the National Match website, the match rate from 2012 to 2015 is approximately 64%, while students that complete this course have a match rate of 83%. **Implications:** This course appears to have positively impacted students' perceptions and success with the residency application process. It is possible that other pharmacy schools could benefit from a similar elective course.

**The Assessment of Changes in Student Pharmacists' Knowledge, Skills, and Attitudes Toward Older Adults.** Krista L. Donohoe, *Virginia Commonwealth University*, Fawaz M. Alotaibi, *Virginia*

*Commonwealth University*, Kelechi C. Unegbu-Ogbonna, *Virginia Commonwealth University*, Emily P. Peron, *Virginia Commonwealth University*, Kacie Powers, *Virginia Commonwealth University*, Veronica P. Shuford, *Virginia Commonwealth University*, Patricia W. Slattum, *Virginia Commonwealth University*. **Objectives:** To determine if student pharmacists' knowledge, skills, and attitudes toward older adults improve throughout their pharmacy school education with an integrated geriatrics curriculum and a required advanced pharmacy practice experience (APPE) in geriatrics. **Method:** A two-part survey was administered at three different time points (P1, P3, and P4 year) to two large cohorts of student pharmacists (Class of 2015 and Class of 2016) via email. The first part of the survey assessed students' geriatric knowledge and skills. The second part of the survey used the UCLA Geriatrics Attitudes Scale to assess students' attitudes toward older adults. Percentages were reported for each question's responses, and Chi-square was performed to test the statistical difference between the three cohorts (P1, P3, and P4) at 0.05 level of significance. **Results:** Of 286 students who were e-mailed the survey, 236 student pharmacists completed the survey at least at one time point. Student pharmacists showed an increase in confidence from the first year (P1) to the final year after completing APPEs (P4). There was a significant change in student pharmacists' confidence in identifying potentially inappropriate medications for older adults from P1 (2%) to P4 (90%) year. The majority of students also held a positive attitude toward older adults from P1 to P4 year. **Implications:** Integration of geriatrics throughout the didactic and experiential curriculum made an impact on student pharmacists' knowledge, skills, and attitudes toward caring for older adults.

**The Effect of Two Professional Clinical Electives on Advanced Pharmacy Practice Experience Readiness and Performance.** Liza B. Andrews, *Rutgers, The State University of New Jersey*, Christopher D. Adams, *Rutgers, The State University of New Jersey*, Sandy Moreau, *Jersey City Medical Center, RWJBarnabas Health*. **Objectives:** Pharmacy curricula increasingly integrate didactic and experiential learning per Center of the Advancement of Pharmacy Education (CAPE) guidelines promoting patient-centered care. This study evaluates the theory that professional clinical electives are an effective educational method meeting this goal, enhancing both student readiness and performance during early clinical advanced pharmacy practice experiences (APPEs). **Method:** Case controlled observational study of third professional year students completing (E) or not completing (NE) defined clinical electives. Students and faculty perceptions regarding readiness and likely performance were assessed through survey. APPE grade comparison was conducted to assess performance. **Results:** Of 100 student surveys (73, E; 27, NE), approximately two thirds (63%, E and 62% NE) strongly agreed clinical electives better prepared students for APPEs. Elective students felt more confident and able to "think on their feet" (strongly agreed 55% vs. 17% and 45% vs. 13%, respectively). Faculty ( $n=20$ ) perceived stronger baseline clinical problem solving skills, preparation and performance in clinical elective students. Curricular adjustment to mandate clinical electives were perceived as program strengthening (94% students & 95% faculty agreed or strongly agreed). Assessment of 247 APPE grades revealed more elective students achieving an A letter grade in early direct patient care experiences (84% vs. 77%). **Implications:** Both surveyed perceptions and grade performance supported that clinical electives enhance student APPE readiness and performance, supporting a planned curricular change to mandate a clinical elective. In these cohorts, students were more confident and performed stronger in

direct patient care rotations (during Cycle 1-3) when a clinical elective was completed prior.

**The Effect of Various Learning Experiences on Professional Identity in First Year Pharmacy Students.** Katelyn Smith Quartuccio, *Notre Dame of Maryland University*, Ray Weber, *Notre Dame of Maryland University*, Jonathan Thigpen, *Notre Dame of Maryland University*, Min Kwon, *Notre Dame of Maryland University*. **Objectives:** To assess the impact of various learning experiences (eg coursework; student organizations; interprofessional education) on first-year pharmacy students' perception of professional identity. **Method:** Forty-five students participated in a pre- and post-survey, incorporating items from the Professional Self Identity Questionnaire (PSIQ). Pre-surveys were administered during the first week of school; post-surveys were administered during the last week of the fall semester. In addition, students were asked to rank the impact of various experiences on identity development. Paired pre- and post-survey responses were analyzed with Wilcoxon signed-rank tests. **Results:** The majority of questions demonstrated an improving trend in professional identity. Significant differences were demonstrated in student responses to the statements: "The primary role of a pharmacist is to provide patient care" ( $Z = -2.057, P = 0.040$ ) and "Pharmacists provide disease state education" ( $Z = -2.983, P = 0.003$ ). Students demonstrated significant improvements in the PSIQ items of conducting patient assessments ( $Z = -2.234, P = 0.025$ ) and using patient records ( $Z = -2.528, P = 0.011$ ). Per student rankings, Pharmacist Care Lab had the highest impact, whereas White Coat Ceremony had the lowest impact, on knowledge of: overall pharmacist's role; pharmacist's role in community service; service learning; and perception of the pharmacy profession. **Implications:** Students demonstrated improvement trends in professional identity in the vast majority of areas during their first semester. Future research will assess further developments in professional identity as students advance through the curriculum as well as the value of additional curricular components.

**The Relationship Between Pharmacy Student's Beliefs About Medications and Their Counseling Behaviors.** Kelly Conn, *St. John Fisher College*, Kobi Nathan, *St. John Fisher College*, Alexander DeLucenay, *St. John Fisher College*, Anthony Corigliano, *St. John Fisher College*. **Objectives:** Objectives were to assess pharmacy student beliefs about medications and the relationship with grades in a pharmacy counseling course. **Method:** Third year pharmacy students in a pharmacy counseling course were surveyed using the previously validated Beliefs about Medications Questionnaire-General (BMQ-G). The BMQ-G includes four subscales (overuse, harm, benefit, and sensitivity to medications) rated on a 5-point Likert scale (higher scores represent stronger feelings). Belief profiles were created using two-step cluster analysis to group students with similar beliefs. Students also reported demographics and prior work in a pharmacy setting. Grades from a 'simulated' patient counseling session were collected via school records. Student t-test and multivariate linear regression were used to compare beliefs with grades. **Results:** Among 66 students (84.5% response rate), 54.5% were female, 80.3% white, and 77.3% non-Hispanic. Nearly all students (84.8%) reported working in a pharmacy setting. Overall mean(sd) scores on the beliefs scales were: overuse 3.12(.76), harm 1.83(.53), benefit 3.99(.55), sensitive soma 2.37(.82). Cluster analyses revealed two beliefs profiles: Negative Profile-more feelings of overuse, harm, and sensitivity to medications and less benefit, Positive Profile-less feelings of overuse, harm, and sensitivity to medications and greater benefit. Students with positive belief profiles had higher grades compared to students with negative

belief profiles (90.0 vs. 87.2,  $p = .014$ ). Findings remained in a multivariate linear regression controlling for gender and prior work in a pharmacy. **Implications:** As counseling becomes primary to a pharmacist's role, findings from this study demonstrate the need for greater understanding about the relationship between pharmacist's beliefs about medications and patient counseling.

**The Role of Professional Engagement Within Professionalism Development of PharmD Students.** Tyler D. Naegele, *The University of Toledo*, Jangus Whitner, *The University of Toledo*, Michael J. Peeters, *The University of Toledo*. **Objectives:** To determine the role of professional engagement by student pharmacists within their professional development and academic success **Method:** We used a newly-developed instrument for measuring student pharmacists' professional engagement –the Student Pharmacist Inventory of Professional Engagement (S-PIPE). This survey, given to final-year pharmacy students in December 2015, targeted participants' level of involvement in professional pharmacy organizations and students' attitudes about the pharmacy profession. We obtained participants' PharmD grade-point-average (GPA) and linear regressed it with S-PIPE score on DIT (DIT is measure of professionalism development). **Results:** Thirty-one students participated in this IRB-approved survey, with mean age of 24 years old, 11 males, 20 females. Overall, the S-PIPE was reliable (Cronbach's-alpha=0.95). Regressing GPA and S-PIPE score on DIT was not significant ( $R = 0.37, p = 0.87$ ). However, S-PIPE score was associated with students' reported involvement in pharmacy organizations ( $r = 0.37, p = 0.04$ ). In post-hoc analyses, age showed a negative relationship with involvement, where older students were less likely to be engaged in a pharmacy organization ( $r = -0.47, p = 0.01$ ). Curiously, males showed a higher degree of professional development than females ( $r = 0.40, p = 0.03$ ); on further review, males also were lower on initial DIT scoring so improvement was more likely. As expected, male participants did also have correspondingly higher S-PIPE scores [males:81(14), females:72(13)]. **Implications:** In this small cohort of student pharmacists, the S-PIPE was not associated with professional development. Professional engagement's influence within professional development appears more complex than this simple linear analysis could evaluate. As a post-hoc finding, age and gender may influence initial professionalism, subsequent professional development, and S-PIPE score.

**The STRICE (Syphilis Testing Result Interprofessional Counseling and Education) Simulation.** Kathryn K. Neill, *University of Arkansas for Medical Sciences*, Letycia Nunez-Argote, *University of Arkansas for Medical Sciences*, Mari Davidson, *University of Arkansas for Medical Sciences*, Amber Teigen, *University of Arkansas for Medical Sciences*, Michael Anders, *University of Arkansas for Medical Sciences*, Jill Johnson, *University of Arkansas for Medical Sciences*, Tiffany Lepard, *University of Arkansas for Medical Sciences*. **Objectives:** To describe the design and evaluate the delivery of an interprofessional education (IPE) simulation focused on interpretation of laboratory results, clinical recommendations, and counseling for a positive syphilis test result. **Method:** An interprofessional simulation was designed to immerse students in the Triple Aim and concepts of IPE through collaboration in providing education and counseling for syphilis test results for a pregnant patient. Pre-readings were provided. Interprofessional student teams had 10 minutes to prepare before beginning a 10 minute standardized participant encounter. A 30 minute debriefing for reflection on the experience and areas for improvement followed. Students completed post-activity self-assessments of the learner's perceptions of IPE and the simulation on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) and evaluated

patient/family-centered care skills. Open-response questions were solicited. Descriptive statistics are reported. **Results:** Students (n=79) from pharmacy, genetic counseling, medical laboratory sciences, cytotechnology, physician assistant, and public health participated. Students perceived learning with other professional students was valuable (4.74), the activity improved communication skills with patients/public (4.79), increased knowledge of another profession (4.67), and improved teamwork skills (4.68). Students (99%) agreed the simulation demonstrated the value of providing team-based education and agreed (96%) this was a valuable educational activity. **Implications:** Students perceived the simulation was effective in immersing learners in concepts of the Triple Aim and IPE and developing skills necessary to communicate effectively. The simulation was effective in combining basic science knowledge with clinical decision-making for a variety of learners.

**The US Pharmacy Faculty Perceptions About the Scholarship of Teaching and Learning (SoTL).** Reza Taheri, *West Coast University*, Mohammed A. Islam, *West Coast University*, Rahmat M. Talukder, *The University of Texas at Tyler*, Sarah McBane, *University of California, San Diego*. **Objectives:** To assess knowledge, perception, and attitude of US pharmacy faculty towards Scholarship of Teaching and Learning (SoTL). **Method:** A survey instrument was distributed through SurveyMonkey to faculty members in the US Schools and Colleges of Pharmacy. Survey items solicited information about faculty's awareness, perception, and attitude towards SoTL and its institutional recognition. Descriptive statistics were utilized for data analysis. **Results:** A total of 638 faculty representing 100% of ACPE accredited schools and colleges of pharmacy participated in the study. Over 80% of the respondents identified published works on instructional design/assessment, curriculum development/review, and current teaching/learning principles as SoTL. Developing a new course, integrating technology into teaching, and course improvement were identified as SoTL by 25%, 27%, and 18% of respondents, respectively. Over 94% of participants indicated that institutional policies should encourage SoTL. More than 70% of respondents indicated that SoTL should be incorporated into criteria for promotion/tenure and 78% would like SoTL to be accepted as criteria for merit-based salary increase. Over 90% of the respondents strongly agree/ agree that SoTL enhances student learning and faculty teaching effectiveness through reflection. **Implications:** While results show that US pharmacy faculty well recognize and value SoTL, it suggests a need for faculty development in classical definition of SoTL. There was a strong sentiment about the importance of incorporating SoTL as criteria for promotion/tenure and merit-based salary increase. Our findings should serve as an impetus for inclusion of SoTL productivity in institutional reward structure.

**The Use of a Simulated Medication History Activity to Improve Student Performance at Addressing Medication-Related Problems.** Vincent C. Dennis, *The University of Oklahoma*, Teresa H. Truong, *The University of Oklahoma*, Heather Edwards, *The University of Oklahoma*. **Objectives:** To determine whether students address medication-related problems (MRPs) to the same extent and improve their abilities through conducting medication histories in a 1 semester laboratory course during the third professional year. **Method:** One of five MRPs was planned for each profile and the role was provided to the student "patient." Students rotated through the role of patient while a classmate probed for and documented a medication history. Sessions were graded using a ten point rubric to assess completeness, including the extent to which students addressed the MRP, adverse effects and effectiveness of therapies according to one of five scaled categories.

Students received feedback before repeating the process with a different MRP. **Results:** The average score was initially highest for addressing an incorrect administration time, followed by an ineffective drug, an adverse effect, non-adherence and a drug interaction. Students who did not detect their MRP to any extent decreased from 20% to 10% at the second medication history. Average performance at detecting/addressing each type of MRP increased at the second session, with the highest and lowest scores for incorrect administration time and non-adherence, respectively. Addressing adverse effects and effectiveness of therapies also improved at the second session and overall average scores increased from 7.3 to 8.3. **Implications:** The current process identifies deficits in conducting medication histories to detect MRPs. The use of two instructor assessments with feedback can improve overall performance in a simulated environment. It is unclear if all MRPs pose the same difficulty and whether laboratory performance predicts experiential performance.

**The Use of the Acronym "MEDICATION" to Aid in the Identification of Medication-Related Problems.** Elizabeth T. Skoy, *North Dakota State University*, Heidi Eukel, *North Dakota State University*, Jeanne E. Frenzel, *North Dakota State University*. **Objectives:** To assess the effectiveness of the MEDICATION acronym to aid in the identification of medication-related problems. **Method:** Third-year professional pharmacy students attended a didactic lecture on the role of medication-related problem (MRP) identification in the provision of medication therapy management (MTM). After learning about the definition, identification and documentation of MRPs, students were asked to review a simulated MTM patient case. Students used an MRP reporting form to identify as many MRPs as possible. Faculty then introduced students to a methodical way of identifying MRPs by utilizing a faculty-developed acronym MEDICATION. (M-Match, E-Value, D- Dose/Duration, I-Interactions, C-Cost, A-Adverse effects, T-Taken, I-Immunizations, O-Outcomes, N- Needed therapy). Students then reviewed the same simulated case and were asked to utilize the acronym to identify any additional MRPs not previously identified. Faculty collected all completed MRP reporting forms before and after the use of the acronym to determine its effectiveness in MRP identification. **Results:** Eighty-one students completed the activity. All students identified additional MRPs after utilizing the acronym. Before utilizing the acronym, students identified a mean of 3.37 potential MRPs. After the use of the acronym, students identified an average of 5.47 potential MRPs. This resulted in a statistically significant mean change of 2.10 ( $p < 0.05$ ). **Implications:** Utilizing the MEDICATION acronym is an effective approach to medication-related problem identification.

**Training Pharmacy Technicians to Administer Immunizations.** Kimberly McKeirman, *Washington State University*, Kyle Frazier, *Washington State University*. **Objectives:** To develop an effective accredited training program teaching pharmacy technicians to administer immunizations. **Method:** A 2-hour self-study and 2-hour live pharmacy technician immunization administration training program was developed in accordance with ACPE accreditation requirements. Learning objectives included: 1) Demonstrate proper technique when administering intramuscular and subcutaneous injections; 2) Demonstrate the use of universal precautions pertaining to blood borne pathogens; and 3) Explain proper procedures for managing a vaccine reaction emergency. This training program was provided to 25 certified pharmacy technicians in Idaho during December 2016. An 8-question survey was utilized to assess participant comfort and confidence. **Results:** After completing the training program, 25 pharmacy technicians demonstrated competency in immunization

administration. All 25 technicians participated in the survey. The majority of respondents either agreed or strongly agreed after completing the training they felt comfortable administering an immunization (92%); felt confident location the correct site (92%); felt confident selecting the correct needle (92%); felt comfortable with documentation (92%); and felt comfortable responding to an emergency (92%). They were also interested in providing immunizations at their pharmacy (92%), would recommend the training to a friend (92%), and liked the combination of online and live training (92%). **Implications:** This program is the first pharmacy technician immunization training in the United States. We successfully prepared technicians to begin administering immunizations in accordance with the new state law. As other states consider enhancing the pharmacy technician role, this program could be adopted by other universities and pharmacy organizations to meet the growing need.

**Transitions of Care Medication Reconciliation in the Home by Student Pharmacists with VNA Clinicians.** Jennifer Towle, *MCPHS University–Worcester/Manchester*, Cheryl Abel, *MCPHS University–Worcester/Manchester*, Nicole Carace, *MCPHS University–Worcester/Manchester*. **Objectives:** To describe students' roles in transition of care medication reconciliation in the home with Visiting Nurse Association (VNA) clinicians and discuss medication related problems (MRP) discovered. **Method:** Student pharmacists completing Advanced Pharmacy Practice Experience (APPE) rotations attend post-discharge home visits with VNA clinicians and perform medication reconciliation. Demographic information and MRPs are identified and documented. An electronic form is used to track: barriers to taking medication, number of medications (over-the counter, prescriptions, herbal, and vitamins), patient's overall understanding of medication, drug-drug interactions (DDI), inappropriate prescribing, and missing medications. Students also track the number of times they were able to make a recommendation to the patient's healthcare provider and if that recommendation was accepted. **Results:** Seventeen students of pharmacy visited 96 patients' homes from September of 2016 to January of 2017. Patients ranged in age from 30 to 99 with an average of 70 years old. Thirty-three percent of patients took more than 10 prescription medications and 14% took at least 6 nonprescription medications. Some of the MRPs identified by the students included 27 patients with a significant DDI, 42 medications prescribed inappropriately and 17 missing medications. Thirty-seven of the identified MRPs were reported to the prescriber during the visit and 13% of those recommendations were accepted. Students counseled 84% of patients about their medications. **Implications:** Pharmacy students can play an important role in transitions in care through medication reconciliation in the home. The VNA provides a unique setting for students and the incorporation of student pharmacist may improve healthcare outcomes.

**Trends in Use of Electronic Health Record Usage Among US Colleges of Pharmacy.** Kali VanLangen, *Ferris State University*, Brett Johnson, Gregory Wellman, *Ferris State University*. **Objectives:** To examine the current utility, perceived benefit, and future plans for electronic health record (EHR) use in the didactic curriculum of doctor of pharmacy programs in the United States. **Method:** An electronic survey was distributed to two AACP SIGs (TiPEL and Laboratory Instructors). Content areas in the 10-question survey included current utilization in the didactic curriculum, perceived benefit for preparing students for pharmacy practice experiences, and future plans for implementing or improving EHR use. Data on institutional EHR usage was analyzed using SPSS. **Results:** A total of 43 out of 130 schools responded to the survey (31.8%). Of the respondents currently using EHRs (37%), more than 60% have been using an EHR in the classroom

for 2 years or less while 18.2% reported 5 or more years of experience. The most common application of EHR was for clinical cases (77%) followed by pharmaceutical care lab courses (59%), other uses in pharmacotherapeutics (27%) and interprofessional education (23%). Of those not currently using EHRs (63%), the vast majority (84%) plan to integrate EHRs into didactic coursework within the next 2 years. **Implications:** Electronic health records are used extensively throughout health systems indicating a need for pharmacy student competencies prior to pharmacy practice experiences. EHRs appear to be used by many colleges of pharmacy in P3 courses where clinical cases are being discussed. Further research into the value of EHR usage at earlier stages of professional programs, including skills labs, OSCE and other pharmacy coursework may be helpful given increasing EHR use in healthcare settings.

**Use of Problem Based Learning to Inform High School Students of a Career in Pharmacy.** Sheila M. Wilhelm, *Wayne State University*, Megan Kucemba, *Wayne State University*, Marina Pittiglio, *Wayne State University*, Francine D. Salinitri, *Wayne State University*. **Objectives:** In an attempt to increase awareness of and interest in pharmacy as a career while attracting 21st century learners, approaches that are student-driven and provide skills-based career-oriented experiences are necessary. We developed a program that incorporates the Problem-based learning (PBL) pedagogy, an ideal way to develop the 21st century learner, to inform high school students of a pharmacy career. **Method:** High school students participated in a three-day PBL experience. Prior to and following the PBL experience, students completed a survey regarding their perceptions of a career in pharmacy and their experience with PBL. **Results:** Of 191 students who participated in the experience, 177 completed the pre-survey (92.7%) and 175 completed the post-survey (91.6%) regarding perceptions of a pharmacy career. Themes such as patient counseling, patient safety, and medication administration were identified by students prior to the PBL experience. Afterwards, students reported a greater variety of more complex roles and responsibilities of a pharmacist. Aspects of the PBL program students reported to be most beneficial included engaging in problem solving, pretending to be a pharmacist, participating in a clinical skills challenge, compounding, and learning about various healthcare fields. Prior to the PBL experience, 31% of students said they considered pharmacy as a career compared to 54% of students following the experience. **Implications:** Use of a student-directed PBL experience provides high school students with a better understanding of the pharmacy profession, increases interest in the career, and stimulates excitement through authentic pharmacy simulations.

**Use of a Multidisciplinary, Integrated, Flipped Classroom to Improve Student Learning and Retention.** Donna M. Adkins, *Appalachian College of Pharmacy*, Charles Breese, *Appalachian College of Pharmacy*. **Objectives:** A fully integrated course focused on common chronic disease-states, delivered by "flipping" the classroom, provides an opportunity to maximize student learning, improve critical thinking, and promote retention of the material. **Method:** Students were placed in small workgroups to facilitate self-directed learning. Guided cases introduced the disease-states and the basic and clinical sciences related to determining appropriate therapy. Concepts students found to be difficult were reinforced using mini-lectures. Chronic diseases (hypertension, lipids, pulmonary, diabetes, and thyroid disorders) commonly exist with other conditions, so reinforcement becomes easier during subsequent courses. **Results:** Data from formative and summative assessments, milestone exams, and student feedback on course evaluations indicate students learned and retained content from this

course better than previous courses, where content was system-based or lecture-based format was used. Students performed equally or better on exam questions that were the same or similar to questions used in previous years. Long-term retention was evident on the milestone exam, where students performed at higher levels on the content from this course compared to all other content on the exam. Student course evaluations indicate that the course was well received and students felt they effectively learned the content in the course. **Implications:** Courses such as these foster critical thinking skills, improve student learning and retention of course material and increase student self-learning skills.

**Use of a Video Module to Improve Faculty Understanding of the Pharmacists' Patient Care Process.** Crystal Deas, *Samford University*, Angela R. Thomason, *Samford University*, Robert M. Riggs, *Samford University*, Michael Thomas, *Samford University*, Michael G. Kendrach, *Samford University*. **Objectives:** Evaluate change in faculty's knowledge and perceptions after an educational video module on the Pharmacists' Patient Care Process (PPCP). **Method:** A workgroup was formed by the School of Pharmacy with an initiative to educate full-time faculty on the PPCP. The workgroup developed a 22-minute video module encompassing the definition, application, and introduction/assessment of PPCP in the curriculum. A pre-assessment was distributed to school faculty using an online survey instrument (Qualtrics©). Three weeks after the pre-assessment, the workgroup launched the video module and post-assessment, which was accessible for 3 weeks. The pre- and post-assessments were the same instrument and evaluated two domains – knowledge (multiple choice questions and matching) and perceptions (five-point Likert scale rating). Faculty participation in the assessment was voluntary and anonymous; email reminders were sent to maximize participation. This research was IRB-approved. **Results:** Thirty faculty completed the pre-assessment, and 31 completed the post-assessment (73% and 75% response rate, respectively). An improvement in perceptions of PPCP was indicated by a 20% increase in agreement with the statements: "I feel that I am very knowledgeable about PPCP" and "I feel that implementation of PPCP into pharmacy practice would improve patient health outcomes." Knowledge scores on overall incorporation of PPCP into the School's curriculum increased from 23% to 50%. Additionally, participants' ability to match a practice activity with corresponding PPCP step improved from 76% to 80% accuracy. **Implications:** A short video module was effective at improving faculty knowledge and perceptions of PPCP.

**Use of an Online Spaced-Education Game to Study Top 200 Drugs in a Laboratory Course.** Karen R. Sando, *University of Florida*, Xiaoying Feng, *University of Florida*. **Objectives:** To describe the use of an online spaced education (SE) game to study top 200 drug information in a 1st year skills laboratory course. **Method:** Two-hundred thirty six students enrolled in a voluntary online SE game (QStream challenge) across two semesters. Fifteen multiple-choice questions (MCQs) were sent via email in the fall and spring semesters focusing on cardiovascular and neurological agents, respectively. The challenge delivered 2 questions every 2 days and re-sent questions answered incorrectly after 7 days. Two correct answers were required to retire a question. Top 200 drug knowledge was evaluated with an examination at the conclusion of each semester. Levels of engagement with the game, differences in performance on challenge MCQs, impact on top 200 drug examination performance, and student perceptions were evaluated. **Results:** There was a high level of engagement in the challenge in both the fall (83% participation) and spring (73% participation) semesters. Participants had a significantly higher correct rate

on the current question attempt vs. the initial attempt for 9 of the 15 questions in the fall and 1 of 15 questions in the spring. Use of QStream did not significantly affect top 200 drug examination performance or retention of top 200 drug information. Students' self-efficacy to recognize brand/generic names and common indications significantly improved after use of QStream. Student perceptions of the game were positive. **Implications:** Use of an online spaced-education game did not significantly affect top 200 drug examination scores despite high levels of student engagement and positive student perceptions.

**Using Social Media, Focused Learning Activities, and Reflections to Impact the Development of Empathy Skills.** Heidi N. Anksorus, *University of North Carolina at Chapel Hill*, Courtney L. Bradley, *High Point University*. **Objectives:** To assess how incorporation of social media and empathy-focused activities in skills lab impacts third-year pharmacy (PY3) students' self-efficacy scores. Lab activities were completed utilizing social media to further develop students' awareness, empathy, and communication skills. **Method:** Students completed an initial survey assessing baseline empathy and self-efficacy (Toronto Questionnaire and 10 Self-efficacy questions). Developmental activities were completed including following a story via social media (e.g. Facebook, Twitter, blogs), writing personal reflections, and discussing findings with a small group. Students were re-assessed at semester's end with a survey including the original empathy and self-efficacy questions. Statistical tests were used for pre-post comparison. Descriptive and qualitative analysis were used for reflections and student feedback. **Results:** The survey data was analyzed for 138 students (85.7% of the class) who completed and consented for both surveys. The Toronto Questionnaire overall mean decreased (47.1957 to 46.0797;  $p = 0.012$ ). The sum of the 10 Self-Efficacy questions increased (72.51 to 73.04;  $p = 0.603$ ) and when analyzed separately, four questions increased in score, and two had a significant increase. **Implications:** Although challenging to teach, social media was used as an avenue to develop empathy skills. While the data demonstrated a decrease in overall empathy and no significant change in total self-efficacy scores, itemized data points demonstrated some significant increases in self-efficacy in addition to positive qualitative student data. Lack of significance may result from several limitations including but not limited to, short intervention period, understandably varying baseline scores, and potential over-estimation in initial confidence levels.

**Using a Mock Board of Pharmacy Disciplinary Hearing to Teach Administrative Law, Empathy, and Professionalism.** Kyle W. Parker, *Ohio Northern University*, Natalie A. DiPietro Mager, *Ohio Northern University*, D. Christopher Hart, *Ohio Northern University*, Benjamin D. Aronson, *University of Minnesota*. **Objectives:** To provide student pharmacists with a simulation of a Board of Pharmacy disciplinary addiction hearing and measure the impact on knowledge, empathy, and professionalism. **Method:** Pharmacy faculty obtained materials from a real, prior Board hearing. The actual respondent, lawyer, and former Executive Director of the Board along with a Board Agent participated in re-enacting the hearing. Students volunteered to serve as Board Members and President, asked questions of the witnesses, and deliberated per Board procedure. Audience members were also active participants; they had the opportunity to write questions for Board Members to ask and to provide their assessment of the facts and recommended action for the Board to take. After the event, student learning and perceptions were assessed through 5 knowledge-based questions, 10 opinion-based questions, and 1 open-ended reflective prompt. **Results:** One hundred forty-one students attended the event; 138 (97%) completed the assessment. The knowledge-based questions

were answered correctly 95% of the time. All students reported a greater understanding of what occurs during a Board Hearing, and 97% reported the experience was preferable to attending a lecture. After the Hearing, 97% felt able to empathize with someone called before the Board; 99% felt more confident that they would take correct actions if working with an impaired pharmacist; and 98% were more aware of the consequences of drug theft and addiction. Students indicated the Mock Hearing was an impactful learning experience. **Implications:** Other institutions may consider implementing similar exercises to engender knowledge, empathy, and professionalism regarding drug addiction and regulatory compliance.

#### **Utilizing Structured Visits to Community Pharmacies to Improve Student Confidence in Therapeutic Decision-Making Skills.**

Wenye Yang, *University of Maryland*, Victoria Zhu, *University of Maryland*, Patrick T. Rocafort, *University of Maryland*, Deanna Tran, *University of Maryland*, Hyunuk Seung, *University of Maryland*. **Objectives:** There is limited research on student pharmacists' confidence and thought-process regarding the self-care decision-making process. The objective of the study is to determine students' confidence in therapeutic decision-making skills utilizing structured visits to community pharmacies. **Method:** During the self-care course at the University of Maryland, third-year students participated in structured visits to community pharmacies to enhance their decision-making skills when determining over-the-counter (OTC) medication recommendations. Pre- and post-course surveys were administered to 147 students. Students' previous pharmacy experiences along with their confidence in utilizing 15 different agent, patient, and disease-state related variables were collected. The responses from both surveys were compared to determine changes in student confidence. **Results:** Mean conversion scores for confidence in utilizing all 15 variables studied significantly improved when comparing post-course with pre-course ( $p < 0.001$ ). All variables significantly increased in confidence ( $p < .01$ ) and the 6 variables that showed the highest increase in student confidence are: side effects (54.3%), agent related (51.7%), patient related (49.7%), disease-state related (47.4%), elderly (43.4%), and contraindications (43.3%). The 6 items that showed the least amount of increase were: difference in prices (14.3%), breastfeeding patients (28.1%), brand/generic medications (29.8%), difference in formulation (30.7%), pregnant patients (31.2%), and children (31.8%). **Implications:** The course effectively increased students' confidence in utilizing patient, agent, and disease-state variables to make appropriate OTC medication recommendations. Items with a lower increase in confidence should be emphasized in the future.

#### **Utilizing an ICU Teaching Rounds Simulation to Enhance Collaborative Skills and Sepsis Pharmacotherapeutic Knowledge.**

Zachary N. Jenkins, *Cedarville University*, Emily Laswell, *Cedarville University*, Nicole K. Stute, *Cedarville University*, Lauren Bluhm, *Cedarville University*. **Objectives:** With their evolving role, pharmacists are becoming more involved in interdisciplinary rounding. The goal of this prospective, observational cohort study was to determine if simulated interdisciplinary teaching rounds improve confidence, collaborative attitudes, and therapeutic knowledge in pharmacy students when compared to didactic lecture alone. **Method:** Students participated in a didactic sepsis lecture followed by a simulated interdisciplinary rounding experience. Confidence and collaborative attitudes were assessed using a 5-point Likert-type scale (1 = Strongly Disagree, 5 = Strongly Agree). Multiple choice questions were used to assess knowledge levels. Additional questions were added to assess simulation perceptions. Students completed assessments at three points in time: pre-lecture, post-lecture, and post-simulation. Data was analyzed

using paired t-tests. **Results:** Confidence levels and collaborative attitudes related to interdisciplinary rounds improved significantly following the simulation (2 of 4 items,  $p < 0.001$ ; 3 of 5 items,  $p < 0.022$ ). Changes in knowledge improved following the simulation, but these were not found to be statistically significant ( $p = 0.814$ ). In addition, most students agreed or strongly-agreed that the simulation reinforced knowledge gained from lecture (100%), lecture plus a simulation was the best way to learn about the topic of sepsis, and the simulation helped reinforce critical-thinking skills (96%). **Implications:** The results of this study suggest a simulated interdisciplinary rounding experience may increase student confidence during teaching rounds and improve attitudes towards working with other healthcare professionals. Since interdisciplinary teaching rounds are often an important part of practice, incorporating such simulations into pharmacy curricula may be beneficial.

#### **Validation of a Checklist to Evaluate Student Performance in a Problem Based Learning Group.**

Alison M. Lobkovich, *Harper University Hospital*, Sheila M. Wilhelm, *Wayne State University*, Francine D. Salinitri, *Wayne State University*. **Objectives:** Problem-Based Learning (PBL) is a student-centered pedagogy that uses authentic, ill-structured cases as the stimulus for learning pharmacotherapy. PBL is a course series in the Wayne State University-Eugene Applebaum College of Pharmacy curriculum. Evaluation of student performance in a PBL group requires a standardized, valid tool. Our objective is to validate a performance checklist. **Method:** In 2013 a standardized performance checklist was developed. The Angoff Method for Standard Setting was used to determine the weighted score of each checklist item. Scores from 2015-2016, GPA, and exam scores were used to evaluate the checklist. IBM Statistical Package for the Social Science (SPSS) predictive analytics software was used. **Results:** Seventy facilitators generated 1506 evaluation reports for 191 (90 P3s and 101 P2s) students over eight cases. The mean total score was 40.6 +/- 2.5 (P3s) and 39.1 +/- 2.7 (P2s) out of 44.2. Scores improved each semester. The total score from the checklist did not correlate with knowledge or problem-solving exam scores. Seven items (18%, P3s) and 6 items (16%, P2s) were within 5% of the judges' score. All items achieved by  $\leq 79\%$  of students were positively correlated. Of 13 P2 items (78 pairwise correlations), 73 were correlated, of those 57 were moderately or strongly correlated. Of 5 P3 items (10 pairwise correlations) all were correlated, of those 9 were moderately or strongly correlated. **Implications:** The checklist is a unique evaluation tool which assesses skills that are not evaluated elsewhere in the PBL courses and helps to differentiate student performance within a small group.

#### **Value of Implementation of Learning Strategy Check-ins for Low Performers in a Large Self-Care Course.**

Lana Dvorkin-Camiel, *MCPHS University-Boston*, Maria D. Kostka-Rokosz, *MCPHS University-Boston*, Gary Tataronis, *MCPHS University-Boston*, Jennifer Goldman-Levine, *MCPHS University-Boston*. **Objectives:** To examine if low-performing students receiving learning strategy check-ins (LSC's) performed better or felt more successful in the course than those not receiving LSC's. **Method:** Section A received 6 LSCs; section B did not (served as a control). LSC's asked about confidence level before a quiz, and strategies utilized for current/future successful performance. At course completion, students took a voluntary confidential survey about usefulness of LSC's and impact on course success. Section A commented based on experience with received LSCs while section B considered hypothetical usefulness of LSC's. **Results:** Of 278 students enrolled, 235 consented to participation. There were statistically significant differences between section A and B in

low-performing students' level of agreement that LSC's changed their learning approach for the upcoming week (23% vs 56%;  $p=0.003$ ), were helpful in developing a better overall strategy for the course (36% vs 76%;  $p=0.001$ ) and helped them to be more successful in the course (34% vs 80%;  $p=0.001$ ). There was a higher number of C's in section B. **Implications:** A greater percentage of low-performing students in the control group (section B) expected to benefit from multiple LSC's compared to those who actually received them in the intervention group (section A). Despite these findings, we believe LSC's should be considered for low performers. With a negligible investment of faculty time and resources, one-third of the intervention group still felt that LSC's were helpful in increasing their grade.

**What Motivates Pharmacy Practice Faculty to Use Active Learning? Results of a National Study.** Nicole R. Winston, *Marshall University*, Michael J. Rudolph, *Marshall University*, Christopher Gillette, *Marshall University*, Brian Train, *Marshall University*. **Objectives:** Our objective in this study was to evaluate the relationship between faculty intrinsic motivation, extrinsic motivation, demographic variables and the extent of active learning use in the classroom. **Method:** An online survey was administered to individual pharmacy practice faculty members employed at pharmacy schools across the United States. The survey assessed intrinsic motivation regarding personal aspirations and extrinsic motivation which influences behavior to avoid punishment or obtain rewards. The survey evaluated types of active learning strategies used, percent of classroom time dedicated to active learning, and faculty development resources. Descriptive statistics and bivariate associations were used to analyze the results. **Results:** We received 607 completed questionnaires (27.2% response rate). All motivation variables were significantly correlated with the percent of class time dedicated to active learning use ( $p<0.001$ ). Intrinsic motivation demonstrated the highest correlation ( $r=0.365$ ) followed by current extrinsic motivations ( $r=0.191$ ) and ideal extrinsic motivations ( $r=0.192$ ). The number of faculty development resources used was positively associated with higher intrinsic motivation ( $r=0.224$ ,  $p<0.001$ ), while years of teaching experience was negatively associated with intrinsic motivation ( $r=-0.134$ ,  $p<0.001$ ). **Implications:** Our results suggest that pharmacy practice faculty members who are intrinsically motivated to use active learning are more likely to dedicate additional class time to active learning. This would suggest that schools advocating for more active learning should recruit faculty who prefer this approach and actively seek out faculty development opportunities. Furthermore, intrinsic motivation may be positively influenced by encouraging faculty members to attend workshops and supporting faculty to use various active learning strategies in the classroom.

**What to Do With a "Flip That Flopped."** Lisa Charneski, *University of the Sciences*, Gary E. Sloskey, *University of the Sciences*. **Objectives:** To determine if revising a "flopped" flipped-classroom design improves academic performance and perception in a student culture accustomed to a traditional teaching delivery. **Method:** Research Design and Drug Information is a required PharmD course historically delivered as lecture interspersed with active learning in a large classroom. In spring 2015, this course was the first and only course in the curriculum to be delivered as a "flipped" classroom. Contrary to the literature, students' academic performance did not improve and survey data indicated negative perceptions. For the second offering, revisions targeted improvement in pre-class video adherence as well as writing skills and peer-review processes for the capstone evidence-based drug information paper. **Results:** Results of academic performance from the second offering showed a favorable difference. Mean final grade

increased from B- (2015) to B (2016 slightly exceeding the last traditional offering in 2014). From 2015 to 2016, student performance on their capstone paper increased from C (unchanged from 2014) to B. In 2016, adherence with watching pre-class videos improved with 20% students self-reporting "always" watching the videos (up from 6.25%) and only 7.4% reporting "never" (down from 19.4%). Student's perceptions of the course delivery improved in 2016 but with only a moderate number (27.9%) of students either "agreeing" or "strongly agreeing" that course delivery was "effective" (up from 15% in 2015). **Implications:** Revising rather than abandoning a "flopped" flipped teaching delivery might be the appropriate decision, however improvement in student perception might be slow in a student culture otherwise unexposed to flipped delivery.

**Willpower Not Pillpower: A Prescription Drug Abuse Education Program for High School Students.** Hermine Panosyan, *Western University of Health Sciences*, Jacqueline Onwuzurike, *Western University of Health Sciences*, Layla Najibfarid, *Western University of Health Sciences*, Huan (Mark) Nguyen, *Western University of Health Sciences*, Doreen Pon, *Western University of Health Sciences*. **Objectives:** To increase high school students' knowledge about prescription drug abuse (PDA). To engage student pharmacists in a service-learning project to build their leadership, communication and research skills. **Method:** A group of WesternU student pharmacist volunteers, in collaboration with the California Society of Health System Pharmacists (CSHP) WesternU student chapter, created and delivered a 30 minute-long PDA educational program (EP) during class hours to teens in grades 8 through 12 enrolled in area high schools. High school students were given an Institutional Review Board-approved survey developed by student pharmacists before and after the EP to assess the change in their knowledge and beliefs about PDA. **Results:** 517 students received the EP. 232 student surveys were eligible for inclusion in the study. Mean PDA knowledge scores improved from 51% at baseline to 73% at follow-up ( $P<0.0001$ ). At baseline, only 50% of students perceived prescription drugs as being as dangerous and addictive as illegal drugs. At follow-up, a greater percentage of students correctly answered questions regarding PDA safety, addiction, and disposal, compared to baseline (all  $P<0.0001$ ). At follow-up, students were more likely to agree that PDA is dangerous, compared to baseline ( $P=0.001$ ). **Implications:** Prescription drugs are the second most prevalent drug use category abused among youths aged 12-17. Knowledge about the dangers of PDA is limited among teens. A PDA EP delivered by student pharmacists can help increase PDA knowledge among teens and help student pharmacists develop professional skills.

**Workshop for Assessment of Emotional Intelligence, Self-Awareness, and Group Dynamics: Student Characteristics and Impressions.** Deirdre P. Pierce, *St. John Fisher College*, Anne Schweighardt, *St. John Fisher College*, Jennifer L. Mathews, *St. John Fisher College*, Melinda Lull, *St. John Fisher College*. **Objectives:** As a pathway to promote student development according to CAPE Outcomes Domain 4, the objective was to describe the characteristics and impressions of students who participated in a self-awareness and group dynamics workshop, and to characterize their emotional intelligence questionnaire results. Areas of emotional intelligence that were least familiar to pharmacy students are described. Additionally, the most and least prevalent characteristics of students participating in group activities are outlined. **Method:** This assessment included 42 students who self-selected to participate in the co-curricular workshop. They were asked to complete publically available emotional intelligence and group dynamics assessments as well as a pre-workshop survey of the assessments and post-workshop survey of their impressions. Mean scores

and student feedback were collected and analyzed. **Results:** The mean Emotional Intelligence score of this cohort was 69.83/100 (range 59 to 83). Students identified the subset of questions addressing “how people should act in specific scenarios” and “interpretation of facial expressions/emotions” as the most challenging. Based on the group roles assessment, 71% were identified as having good interpersonal skills, and 29% were identified as preferring individual over teamwork. Overall, 97.5% agreed/strongly agreed that the workshop was beneficial as preparation for professional success. **Implications:** Pharmacy students have significant opportunity to improve on the domains of emotional assessment and group dynamics, both of which are necessary for success and satisfaction in the traditionally interdisciplinary health professions. Workshops such as the one described expose students to self-awareness measures and may help students reflect on strategies for improvement.

**iPad Apps for Pharmacy Medication Reconciliation and Discharge Counseling.** Catherine H. Li, *Northeastern University*, Sharon J. Park, *Northeastern University*, Stephanie L. Sibicky, *Northeastern University*. **Objectives:** To identify medical applications, or “apps”, that can be used in a transitions of care setting for the purposes of medication reconciliation and discharge counseling by a pharmacist or a pharmacy student. **Method:** Investigators used keywords to search for medical apps in the Apple Store on an iPad, including “patient education”, “discharge counseling”, “transitions of care”, and “medication reconciliation”. Optimal characteristics identified included a medication reconciliation and discharge counseling checklist, patient-friendly education videos or images, and links to drug information resources. Example application screenshots were developed to meet the needs not addressed by currently available apps. **Results:** There were no apps that met all optimal characteristics, and all applications that were found to be relevant to patient education did not include a checklist for either discharge counseling or medication reconciliation. Most available medical applications were either provider-targeted drug information apps or patient-targeted medication reminder apps. However, several apps including Meditoons™ and My Pep Talk™ contained patient education tools which could be beneficial for discharge counseling. **Implications:** Currently, transitions of care services, including medication reconciliation and discharge counseling, is an area that has vast opportunities for growth and functionality in medical applications. The development of an app to aid pharmacists and pharmacy students in providing these services would greatly benefit both pharmacy student education and efficiency in delivering these services to patients.

### Theoretical Models

**A Paradigm Shift: Study Habits to Learning Strategies.** Jenny A. Van Amburgh, *Northeastern University*, Brittny Schmutz, *Northeastern University*. **Objectives:** Our objective was to establish a process to identify ‘at risk’ students, engage them in a discussion about current study habits, and help them implement effective learning strategies. **Method:** During the spring semester, a new process was presented to students to replace current study habits with effective learning strategies (LS) to enhance learning as it relates to lecture objectives. Sessions were offered to students who failed to meet the minimum passing grade on their first major assessment in our 4 module Comprehensive Disease Management (CDM) course. These discussions were modeled after Dr. Sandra Yancy McGuire’s book entitled “Teach Students How to Learn: Strategies You Can Incorporate into Any Course to Improve Student Metacognition, Study Skills, and Motivation”. During these discussions, students were asked to share current

learning preferences, study habits pre-class, during class, and post-class, and overall learning satisfaction. **Results:** For the past three semesters, seventeen students have participated in LS sessions. We have observed an average increase of approximately 6% for subsequent exam scores in the semester they attended the LS session. Additionally, among the twelve students who have completed more than one semester of CDM, 47% experienced an increase in their CDM grade, 29% experienced a decrease, and 24% maintained their academic performance. **Implications:** With the positive impact observed, mandatory LS sessions for ‘at risk’ students were implemented following their first major assessment in required professional curriculum courses. The initial LS session is now offered as a group with individual sessions as needed.

### An Elective Course to Prepare Students for Clinical Learning.

David Fuentes, *Pacific University Oregon*, Jeremy Hughes, *Pacific University Oregon*. **Objectives:** To develop a course that enhances students’ understanding of the complexity of clinical coursework in the Pharm.D. curriculum, and provide students with tools and activities necessary to help transition from scientific thinking to clinical reasoning. **Method:** The course content was designed using assigned pre-readings, low-stakes multiple-choice self-assessments on therapeutic areas, and treatment guidelines and algorithms across common cardiovascular, neuropsychiatric, endocrine, sexual and reproductive health, and infectious disease topics. Strategies for approaching patient cases and case-based learning were explored. Delivery methods integrated concept mapping, targeted review techniques, critical reading, repeat exposure, and mnemonics, and other study aids. **Results:** A course was designed for first year PharmD students, to be taken before starting therapeutics intensive courses. Principles of instructional design and educational psychology were used to create 6 sessions on pharmacotherapy and 5 self-assessments were completed. All sessions engaged active learning. Students reported 93% increases in implementing targeted review techniques into their studying, as well as a 93% increase in the development of their own pre-session questions. Drops were seen in the students reporting studying alone by 41%. Students agreed that the course helped them to improve study skills, manage learning “gray” areas in healthcare, and develop their approach to reviewing content prior to class to ensure optimal engagement and results. **Implications:** A course on helping students prepare for the complexity of clinical learning can optimize students’ acclimation to the challenges of learning clinical information and can help apply effective study strategies to their academic success.

### Case Study in Mission-Centric Curricular Revision in Light of Standards 2016.

Justin A. Tolman, *Creighton University*, Emily Knezevich, *Creighton University*, Nicole D. White, *Creighton University*, Harsh V. Chauhan, *Creighton University*, Michael S. Monaghan, *Creighton University*, Alekha K. Dash, *Creighton University*. **Objectives:** To provide a successful case study involving revision of a Doctor of Pharmacy Curriculum at an established institution (112 year old pharmacy program) to meet institutional mission objectives, accreditation requirements, and to harmonize educational objectives across courses. **Method:** A Steering Team was formed to guide the curricular revision process. The team evaluated outcome statements and curricular structures at peer institutions. Ad hoc groups recommend focused revisions to program outcome statements to address accreditation mandated elements and institutional mission objectives. Ad hoc groups also recommended revisions to curricular, experiential, and co-curricular structures, course objectives, pedagogy, and/or programmatic assessments based on revised outcomes. The Steering Team received ad hoc group recommendations and compiled them into suggested revisions to Programmatic Outcomes



and the Doctor of Pharmacy Curriculum. **Results:** The Pharmacy Program revised 10 Educational Outcomes and 73 Subcompetency Statements into 7 Educational Outcomes and 28 Learning Objective Statements. These revised statements reflect both accreditation expectations and mission objectives. Mapping current curricular approaches to revised outcomes led to revision recommendations for didactic, experiential, and co-curricular aspects of the Doctor of Pharmacy Curriculum. Program assessments were also changed to evaluate revised outcomes. Faculty and administrative input then guided the development of a coherent plan for curricular revision that included both immediate and modest changes as well as substantial changes to some elements of the curriculum and co-curricular structures. **Implications:** It is possible for an established Pharmacy Program to develop mission-centric curricular changes that comply with accreditation standards while engaging the faculty in a constructive and positive environment.

#### **Curricular Revision Through Backward Design and Integration.**

Lori B. Hornsby, *Auburn University*, Bradley Wright, *Auburn University*, Julaine Fowlin, *Auburn University*, Dan Surry, *Auburn University*, Channing Ford, *Auburn University*, Karen F. Marlowe, *Auburn University*, Timothy Moore, *Auburn University*. **Objectives:** The Accreditation Council of Pharmacy Education (ACPE) standards describe the need for all schools of pharmacy to produce, and provide assessment evidence for the development of “Practice Ready” graduates. The standards also call for curricula to “promote integration and reinforcement of content and the demonstration of competency in skills. . .”. This study describes the backward design process utilized by the Auburn University Harrison School of Pharmacy (AUHSOP) in the first steps of large scale revision of the program’s curriculum. **Method:** Ability based outcomes were adopted from the domains of the school’s definition of a “practice ready” graduate. Utilizing backward design, faculty developed more specific competencies from the ability based outcomes for what graduates should be able to do. From there an organizational structure was developed by the practice ready curriculum team (PRCT), a curriculum steering committee, focused on the development of these competencies in the Pre-APPE curriculum. **Results:** Through backward design, the faculty developed 290 competencies which have been mapped to specific learning experiences throughout the Pre-APPE curriculum. The learning experiences include 12 integrated experiences (2 per semester), 6 semester-long longitudinal experiences and 6 one week intensive workshops, rather than traditional courses. **Implications:** Utilizing backward design, the school is developing a curriculum organized around achievement of competencies rather than the traditional “discipline specific” courses. This organization and backward design process allows the focus to remain on achievement of outcomes and integration rather than the development and delivery of content-driven curriculum.

**Developing a Five-Discipline Interprofessional Education Patient Simulation Using a High-Fidelity Mannequin at a Comprehensive University.** Heather M. Taylor, *University of Missouri-Kansas City*, Elizabeth F. Englin, *University of Missouri-Kansas City*, Carolyn Graves, *Missouri State University School of Nursing*, Paul O. Gubbins, *University of Missouri-Kansas City*. **Objectives:** Interprofessional education (IPE) is a focus of health professions programs to enhance team-based care. However, developing IPE activities at a pharmacy school satellite site on a comprehensive university campus without a health science center poses challenges. The aim was to develop a patient simulation using a high-fidelity mannequin (HFM) as a component of an IPE program in collaboration with four health professions programs, at our partnering non-academic health science center,

comprehensive university. **Method:** During a six month period faculty from pharmacy, nursing, nutrition, physician assistant and psychology programs, met and developed an acute care simulation. The patient simulation was piloted using ten students. Five pairs of students interacted with the HFM using discipline-specific skill events and participated in a post-simulation debrief. Interprofessional Education Collaborative (IPEC) core competency domains 1, 3 and 4 were assessed using a 16-question survey adapted from the IPEC Competency Survey Instrument. **Results:** All students agreed or strongly agreed (SA) on 75% of survey items including that they understood other health professions’ responsibilities. Nine students, (90%), agreed or SA they engaged other health professions in shared decision making. Similarly, eight students (80%) agreed or SA they developed patient care decisions based upon knowledge and experience of the other health professions. **Implications:** Based upon feedback this five-discipline IPE patient simulation using HFMs will be implemented. Approximately 18 pharmacy students will complete this IPE simulation as part of their Introductory Pharmacy Practice Experience. Additionally, we will pursue opportunities to expand IPE activities and create avenues for skills based assessments using HFMs.

#### **Development and Implementation of an Exam Autopsy to Promote Metacognition at Multiple Programs.**

Elizabeth M. Lafitte, *The University of Louisiana at Monroe*, Michelle L. Caetano, *The University of Rhode Island*, Jenny A. Van Amburgh, *Northeastern University*, Ashley Castleberry, *University of Arkansas for Medical Sciences*, Adam Pate, *The University of Louisiana at Monroe*. **Objectives:** To develop and implement a multi-campus, collaborative exam autopsy intervention to promote metacognitive development in students. **Method:** The process was approved by the IRB at all participating institutions. Students at four schools of pharmacy will participate in structured exam reviews utilizing an evidence-based exam autopsy form created by the investigators. The exam autopsy encourages metacognition by having students categorize missed questions and select the reason they answered incorrectly from a list of six common errors (misread error, careless error, concept error, application error, test procedure error, or study error). Students will complete an online post-exam self-assessment, which allows them to reflect on their time, effort, and study strategies used to prepare for the exam and plan improvements for the next exam. Students will receive a copy of their responses to this form as a reminder of their goals prior to the next exam. **Results:** The exam autopsy process has been developed and is currently in the implementation phase. The tool and assessment are being used at UAMS in 113 P2 students in Pharmacology II, at ULM in 97 P2 students in an integrated module, at URI in 132 P1 students in an integrated pharmacology, therapeutics, and medicinal chemistry course, and at NU-SOP in 139 P2 students in the comprehensive disease management course. **Implications:** The multi-site collaboration will allow unique insight into successes and challenges at different sites. The exam autopsy can be implemented at other schools of pharmacy to promote metacognition, self-awareness, and self-directed learning in alignment with ACPE Standards 4 and 10.

#### **Exploration of Virtual Reality Training Modules for a Medical Mission Trip.**

Jeremy R. Fox, *Shenandoah University*, Kacey Carroll, *Shenandoah University*, Michelle Gamber, *Shenandoah University*. **Objectives:** Developing training materials for a medical mission trip can be challenging. Attempts to describe the work environment in enough detail to be useful can be difficult, leaving many participants with limited understanding of what they will experience. Virtual reality technology can provide a novel experience that gives a first person view of the working environment instead of requiring participants

to discover these details on arrival. We aim to present our exploration of this technology in the development of training materials for a specific and recurrent mission trip to Haiti. **Method:** A compact spherical camera was utilized to capture 360 degree images and videos in various clinical locations of a mission trip to Haiti. These assets will be included in training modules with the goal of acclimating future participants prior to arrival to the clinic. **Results:** The faculty found the images rendered using this virtual reality technology accurately captured the activities performed. Students who assisted in capturing images during the mission trip were enthusiastic about this novel concept and were excited to see the initial images. Faculty experience and perception of the utility of this technology along with potential benefits and limitations will be presented. **Implications:** Virtual reality imaging has the power of transporting the trainee to a clinical location allowing for acclimation prior to arrival, which may lead to participant fulfillment of their duties more quickly and efficiently. Further research is necessary to determine the full potential of this novel use of technology.

**From Standards to the Curriculum: Defining the Practice Ready Graduate.** Bradley Wright, *Auburn University*, Lori B. Hornsby, *Auburn University*, Salisa C. Westrick, *Auburn University*, Kristi W. Kelley, *Auburn University*, Jessica Starr, *Auburn University*, Dana G. Carroll, *Auburn University*, Paul W. Jungnickel, *Auburn University*, R. Lee Evans, *Auburn University*. **Objectives:** The Accreditation Council for Pharmacy Education (ACPE) standards describe the necessity for schools of pharmacy to produce “practice-ready” graduates however lack a clear definition of what is meant by “practice-ready”. The standards also require schools to provide assessment evidence of achieving this goal. This study describes the process through which the Auburn University Harrison School of Pharmacy (AUHSOP) defined the “practice-ready” graduate and how this vision has served as the basis for a large scale revision to the professional program’s curriculum. **Method:** An interdepartmental Practice Ready Task Force consisting of faculty from diverse practice settings and disciplines was formed to outline expected abilities of a “practice-ready” graduate. Multiple resources, including those from national pharmacy organizations and ACPE, in addition to the pharmacists’ patient care process and input from the faculty was utilized in the development, cross-check, and approval of the vision. **Results:** The Practice-Ready definition begins with a vision for pharmacy practice in the next ten years and beyond. The definition then consists of 10 domains that outline what the practice ready graduate should be able to do in order to practice within the defined vision. Under each domain are more specific outcomes that define explicit abilities required of a practice-ready graduate. **Implications:** By defining the practice-ready graduate, curricular revision can “begin with the end in mind”. The school adopted the 10 domains as the program’s ability based outcomes (ABOs). From these outcomes, competencies have been developed that are serving as the focus for curricular revision utilizing backward design.

**Implementation of Self and Peer Evaluation Process in Didactic Pharmacy Curriculum.** Sukhvir Kaur, *California Northstate University*. **Objectives:** 1. Discuss the importance of training students in providing effective and constructive feedback 2. Provide the framework to conduct self and peer evaluations in didactic pharmacy education. **Method:** The process of self and peer evaluation involves comprehensive student training during orientation on providing effective feedback, opportunities for students to work in teams for a semester including utilization of team contracts, administering mid-semester formative CATME self and peer evaluations followed by end of the semester summative CATME self and peer evaluations. The formative

non-punitive evaluations are run during mid-semester and results are disseminated to the students in a timely fashion so they can reflect on their behaviors and give them an opportunity to both keep the positive behaviors as well as improve on the behaviors that they were rated low on. It also allows students to visualize their behaviors in relationship to the aggregate peer’s results utilizing a Likert-scale. At the end of the semester, students complete the same summative evaluation which is a graded exercise in an attempt to hold students accountable for being either an effective or non-effective team member. **Results:** We have successfully run this program for over a year and we have received positive feedback from students during focused group discussions. **Implications:** We have found this process to be extremely helpful in promoting improved team performance, and have received positive feedback from both faculty and students.

**Motivating Undergraduate Students to Receive the Influenza Vaccine at a Collaborating University Utilizing Gain-Framed Messaging.** Heather M. Taylor, *University of Missouri-Kansas City*, Lisa M. Cillessen, *University of Missouri-Kansas City*, Paul O. Gubbins, *University of Missouri-Kansas City*, Jerilyn Reed, *Missouri State University Taylor Health and Wellness Center*, Ashley Aumiller, *University of Missouri-Kansas City*. **Objectives:** Influenza (flu) vaccination rates among undergraduates remain strikingly low and well short of national goals. Using a multimedia campaign with strategic gain-framed messages this project aimed to increase flu vaccination rates at a comprehensive university by increasing undergraduate students’ awareness of flu and its vaccine, and to build future co-curricular immunization opportunities. **Method:** In collaboration with a comprehensive university we developed a multimedia campaign that strategically used gain-framed messages through print and digital advertising to educate students about flu, promote the importance of yearly vaccinations, and highlight free vaccinations from the campus health center. Information was disseminated via social media, local news media, the campus bookstore, and information booths at the student center and several campus events. Merchandise discounts, an individual social media contest and competitions among the campus housing units were used to motivate students. **Results:** Approximately 6,000 undergraduates received campaign materials directly. Nearly 7,500 pieces of educational material were distributed, including 6,888 discount coupons, of which 7.1% were redeemed for merchandise. Despite relocating halfway through the fall semester, the campus health center vaccinated as many undergraduates by the end of January as they did during the entire previous flu season. **Implications:** Promoting flu vaccinations using strategic gain-framed messages is a strategy to increase undergraduate flu vaccination rates. This project created a foundation for future co-curricular immunization opportunities and met CAPE standards three and four educational outcomes. To further increase our partner university’s undergraduate vaccination rates, these results will be leveraged to augment the health center’s vaccination efforts with pharmacy student immunizers.

**Shots for Hope: A Service-Learning Academic Model for Community-Based Immunization Services.** Kimberly M. Hampton, *University of the Incarnate Word*, Cynthia N. Nguyen, *University of the Incarnate Word*, Linda Hook, *University of the Incarnate Word Ila Faye Miller School of Nursing*. **Objectives:** •Provide opportunities for PharmD students to demonstrate competencies in vaccine management and administration. •Prepare students with knowledge, skills, and abilities to effectively interact with marginalized or vulnerable populations. •Demonstrate the value of community-based partnerships to improve population health outcomes. **Method:** University of the Incarnate Word Feik School of Pharmacy partnered with San

Antonio Metropolitan Health District, the local public health agency and Haven for Hope, a non-profit campus-based facility with a wide-range of programs aimed at breaking the cycle of homelessness. The service-learning project was held during a week-day afternoon at the multi-purpose Chapel housed on the Haven for Hope campus. PharmD students practiced the various aspects of adult immunization procedures outlined by the Advisory Community for Immunization Practices (ACIP), including recruitment, assessment, consent, education, administration, and vaccine management. **Results:** In January 2017, the pharmacy school-Haven for Hope collaboration provided 143 adult immunizations to 45 patients in three hours. The efforts resulted in positive feedback from the 3 agencies with commitment to offer the event each month. **Implications:** The service-learning project provided the PharmD students with the opportunity to apply classroom learning in an engaging activity to improve unmet immunization needs within one of San Antonio's most vulnerable populations. This model with aspects of collaboration, cultural sensitivity, and implementation of national practice standards provides the students with a practical learning experience to augment desired PharmD competency development.

**Success of a Pilot Pre-Matriculation Self-Instructional Pharmaceutical Calculations Competency Program.** Trenika R. Mitchell, *University of Kentucky*, Jeff J. Cain, *University of Kentucky*, Leah Simpson, *University of Kentucky*, Kelly M. Smith, *University of Kentucky*. **Objectives:** To determine if incoming PY1 students can become competent in performing pharmaceutical calculations using a self-instructional model. **Method:** In concert with a curricular focus on student accountability, a self-instructional pharmaceutical calculations program was developed, consisting of an optional online module launched during early orientation (three months pre-matriculation) and a required pharmaceutical calculations competency examination (PCE) administered during the first semester of the curriculum. In the optional, asynchronous Canvas module, students completed a baseline pharmaceutical calculations quiz that identified their knowledge gaps in order to grant them access to instructional content. Achieving > 80% on the two-hour, 20 short-answer question PCE defined competency. Failure to attain competency within three attempts resulted in failure of the required patient care laboratory course. Those who did not attain competency following the first attempt participated in targeted remediation regimens based upon their learning needs. **Results:** 97 of 139 students (70%) achieved competency on the first exam. One and two remediation attempts were required for 14% and 15%, respectively. A third remediation attempt (1%) was allowed due to logistical issues. Feedback indicates that many students were motivated to perform at a higher level as the stakes of the exam increased. **Implications:** Students can achieve competency on complex pharmaceutical calculations utilizing a self-instructional module when preparation is undertaken prior to matriculation. Student focus groups and an analysis of quantitative factors (e.g., student pre-pharmacy work, GPA) will be conducted to determine future program improvements and factors that influenced PCE success.

**Using Accessory Notes During High-Stakes Assessments to Promote Deeper Learning.** John E. Begert, *Pacific University Oregon*, David Fuentes, *Pacific University Oregon*, Courtney Kraus, *Pacific University Oregon*, Ryan Gibbard, *Pacific University Oregon*, Christopher Foley, *California Health Sciences University*. **Objectives:** To reduce rote learning, learning based on memorization and repetition, and to enhance the use of deeper learning in a psychopharmacotherapy course through the use of accessory notes that students can access during their high-stakes assessments. **Method:** The faculty explored

the literature in instructional design and educational psychology to examine the differences between learning from rote memory and from deeper application-based activities. Students were allowed to develop an "accessory note" on an 8.5" x 11" sheet of paper. Students were allowed to document anything that could help them on the exam. They were allowed to bring their (or a peer's) note to the exams. **Results:** Accessory note themes were identified using qualitative data analysis tools. Frequently appearing on accessory notes were: rote learning elements of the course and included: drug-receptor matches (100%), brand/generic names (90%), neurological pathways (84%), and lecture slides (65%). Areas where application information was transcribed to the accessory notes were in narratives written in students' own words describing pathophysiology (76%) and pharmacology (34%). Sharing of notes was also witnessed and allowed among peers. **Implications:** Students universally enjoyed the approach and commented favorably on the difficulty and fairness of the high-stakes exams, even when using an accessory note. Students mostly added rote learning material to their notes and those who used another peer's note instead of their own reported a decrease in the utility. Use of accessory notes can help reduce stress about information students can access and also help them focus time, energy, and attention on applying what they learn.

**Utilizing the ECHO Model™ to Improve Care in an Underserved Population.** Nissa Mazzola, *St. John's University*, Danielle C. Ezzo, *St. John's University*. **Objectives:** To improve patient care focusing on chronic pain, behavioral health, or substance use disorders for the underserved population throughout 5 large internal medicine practices within a major health system across the metropolitan area. **Method:** The ECHO model™ is a guided practice model where the primary care clinician retains responsibility for managing the patient, operating with increasing independence as their knowledge, skills, and comfort grow. TeleECHO clinics were developed, where primary care providers present patient cases to specialist expert teams who mentor them on how to best manage patients with common, complex conditions. The expert team consists of specialists from Pain Management, Psychiatry, Addiction, Psychology, Internal Medicine, Pharmacy, Care Management, and Social Work/Social Service. Each week the team meets at a central location called the "Hub", and remotely connects with the 5 medicine resident practices called the "Spokes." The weekly, one-hour meetings also include a short didactic presentation to improve content knowledge and share evidence-based best practices. **Results:** Weekly video conferences were initiated and 13 sessions have been held thus far. Spoke audience includes students learners and professionals from multiple disciplines. **Implications:** Participants are given a feedback form to collect insight on how helpful they felt the conference was towards their knowledge and clinical management of the case. Participants are also asked to present a follow up to their case to share if the information and feedback provided benefited the patient.

## **SOCIAL AND ADMINISTRATIVE SCIENCES Completed Research**

**A Decade of Mentoring: Student Perceptions of a Mentoring Program.** Aadaeze Amaefule, *The University of Oklahoma*, Marius Vilimas, *The University of Oklahoma*, Elizabeth Goetzinger, *The University of Oklahoma*, Emily Oliphant, *The University of Oklahoma*, Kyven Zhao, *The University of Oklahoma*, Philip E. Looper, *The University of Oklahoma*, Jane E. Wilson, *The University of Oklahoma*, Michael J. Smith, *The University of Oklahoma*. **Objectives:** To describe the ten-year history of the University of Oklahoma College of Pharmacy's

Mentoring Program and assess students' perceptions of the program's ability to help students transition into pharmacy school and develop skills such as time management, leadership, and professionalism. **Method:** In 2016, students (n=133) currently participating in the Mentoring Program answered a 45-question survey using a 4-point Likert-type scale of agreement (1=Strongly Disagree, 4=Strongly Agree) with program-specific questions. Demographic and program evaluation questions, including questions based on the American Association of Colleges of Pharmacy's Center for Advancement of Pharmacy Education (CAPE) Outcomes, were analyzed. Descriptive statistics and Chi-Square analyses were completed using SAS®v9.4. **Results:** A total of 95 surveys were included for analysis, giving a response rate of 71%. Chi-Square analyses showed no statistically significant difference in the level of agreement between mentor and mentee answers ( $p>0.05$ ). Both mentors ( $\bar{x}A=3.4$ ) and mentees ( $\bar{x}B=3.2$ ) agreed that the program helped them transition into pharmacy school, improved relationship building skills ( $\bar{x}A=3.1, \bar{x}B=2.7$ ), improved study skills ( $\bar{x}A=2.9, \bar{x}B=2.7$ ), encouraged them to be a more active member in the college ( $\bar{x}A=2.9, \bar{x}B=2.7$ ), and improved their professionalism ( $\bar{x}A=3.0, \bar{x}B=2.6$ ). Although not significantly different, mentors agreed and mentees disagreed that the program improved their leadership skills ( $\bar{x}A=3.1, \bar{x}B=2.4$ ) and improved time management skills ( $\bar{x}A=2.9, \bar{x}B=2.4$ ) ( $p>0.05$ ). **Implications:** The Mentoring Program helped first-year students transition into a professional program and provided upperclassmen an opportunity to develop time management and leadership skills.

**A Process for Reaching Consensus on Shared Values for Student Organizations.** Antonio Bush, *University of North Carolina at Chapel Hill*, Jacqueline McLaughlin, *University of North Carolina at Chapel Hill*, Katie M. Buhlinger, *University of North Carolina at Chapel Hill*. **Objectives:** Identify a list of values vital to the UNC Eshelman SoP Student Organizations. **Method:** A three-round Delphi approach was utilized to identify and prioritize shared values among student organization leadership. In round 1, student leaders selected 15 values from a list of 36 organizational values and were provided with an opportunity to include up to 5 suggestions not incorporated within the original list. Student leaders narrowed the 15 values to 12 in round 2. The top 12 priorities were ranked in round 3 and participants were invited to write a brief statement regarding their perspectives of the results. **Results:** Twelve shared values were identified and ranked: Professional development, Improving leadership of your members, Advancing the role of pharmacy, Planning quality events, Networking, Improving the academic experience for peers, Community service, Learning from pharmacy shadowing/speaker, Social outlet, Recruitment/gaining student membership, Attracting students to events, and Gaining national/local attention or awards. Of the ranked values, 10 were linked to four of the School's core values. Open-ended responses included divergence of opinion regarding professional development and affirmation of community service significance. **Implications:** This study contributes to the small but growing body of literature concerning student organizations in pharmacy education and provides a foundation by which this work could be advanced. Given the importance of student organizations in promoting student development, identifying strategies for supporting and facilitating the effectiveness of these groups is critical for optimizing student outcomes and institutional effectiveness.

**An Assessment of Student Pharmacists' Knowledge and Attitudes on Herbal Medications.** David Rhys Axon, *The University of Arizona*, Jill M. Augustine, *Mercer University*, Jeannie K. Lee, *The University of Arizona*. **Objectives:** To assess student pharmacists'

knowledge and attitudes on herbal medications. **Method:** A 31-question survey was administered to all enrolled PharmD students at one pharmacy school. The questionnaire included: 14 knowledge questions (assessed as correct/incorrect) on herbal medications; 7 attitudinal questions (using a scale of 0=do not agree to 5=strongly agree) on the use, recommendation, and education of herbal agents; and 10 demographic questions. Data were analyzed using Chi-square and Mann-Whitney U tests to determine differences between first-/second-year (P1/2) and third-/fourth-year (P3/4) students. This research was determined to be exempt by the university's Institutional Review Board. **Results:** A total of 594 students completed the questionnaire (74% response rate). Among all students, the average on the 14 knowledge questions was 30.7% ( $\pm 0.21$ , out of 100%). A higher proportion of P3/4 students correctly answered 7 knowledge questions ( $p<0.001$ ); whereas a higher proportion of P1/2 students correctly answered 1 knowledge question ( $p=0.02$ ) on the safe use of ginkgo biloba in pregnant women. When considering the statement "herbal medications are efficacious", P1/2 students reported stronger agreement compared to P3/4 students (median of 3.0 versus 2.0,  $p<0.001$ ). Over 73% of respondents agreed that there should be an elective course focused on herbal medications. **Implications:** Student pharmacists' knowledge about common herbal medications is low. Among those with knowledge of herbal medications (P3/4), there was a lack of agreement about efficacy. We found a gap in the knowledge and beliefs about the use of herbal medications, and high interest for an elective course on this topic.

**An Educational Intervention to Improve Pharmacy Student Empathy for Patients on Hemodialysis.** Laura K. Sjoquist, *Cedarville University*, Stephanie M. Cailor, *Cedarville University*, Logan Conkey, *Cedarville University*, Brandon Ng, *Cedarville University*, Rachel Wilcox, *Cedarville University*, Emily Laswell, *Cedarville University*. **Objectives:** To increase student empathy and understanding towards hemodialysis patients through an educational intervention that simulates a hemodialysis patient experience. **Method:** Second year professional pharmacy students (N=36) in a required Renal module were asked to follow key lifestyle modifications of a hemodialysis patient for 3 weeks. This included diet modification, administration of placebo medications, and quality of life complications. Students' understanding of hemodialysis and self-perceived empathy levels were assessed using the Hemodialysis Lifestyle Comprehension survey and the Kiersma-Chen Empathy Scale (KCES) pre-post intervention. An additional 11 post-survey items (7-point Likert-type) captured students' perceptions of the experience. Data were analyzed using frequencies and Wilcoxon signed ranks tests to assess pre-post changes. **Results:** There were significant changes ( $p<0.001$ ) on 7 of the 8 Understanding of Hemodialysis items and 3 of the 15 KCES items following the intervention. Post-intervention, students reported a significantly increased need for a healthcare practitioner to identify with the feelings of a hemodialysis patient ( $p=0.013$ ). Overall, KCES composite scores did not significantly change. Most students agreed this experience increased their empathy towards hemodialysis patients (mean=6.59) and changed their view of patient care (mean=6.47). **Implications:** This intervention improved students' understanding of the hemodialysis lifestyle, demonstrating that these experiences can improve student perceptions of a health condition. Personally experiencing these challenges influenced student understanding of the importance of empathetic care and how empathy affects patient outcomes.

**An Educational Strategy to Enhance Leadership Development of Pharmacy Students.** Erin Allen, *Union University School of Social*

Work, Stephanie M. Coley, *Union University*, Sean R. King, *Union University*, Erica R. Rogers, *Tenova Healthcare- Regional Jackson*, Virginia Schwindt, *Union University School of Social Work*. **Objectives:** The purpose of this investigation was to evaluate the impact of an educational intervention, based on social cognitive theory (SCT), on enhancing leadership development among third-year pharmacy students. It was hypothesized that the pharmacy student group receiving the SCT based educational intervention would report significantly higher scores on the three dependent measures compared to the control group. **Method:** This SCT-based intervention employed a pretest-posttest control group design. The intervention was administered to third-year pharmacy students (n=48) as part of a required Patient Assessment course. Pre and post-test data were collected one week prior to and one week following the delivery of the SCT-based educational intervention to the experimental group. Second-year pharmacy students (n=42) served as the control group and did not receive the educational intervention. **Results:** The two groups did not differ in the distribution of demographic or SCT variables at pretest. Analysis of covariance (ANCOVA) revealed significant differences between the groups on self-efficacy (p=0.014), situational perception (p=0.004), and outcome expectations (p=0.000). **Implications:** The findings of this investigation provide evidence that self-efficacy, situational perception, and outcome expectations are modifiable among pharmacy students through an educational intervention focused on enhancing leadership development. These results may assist other schools of pharmacy in efforts to incorporate leadership development into their curricula. The intervention may be modified and implemented in advanced pharmacy practice experiences, residency programs, and continuing education programs. The value of using a theoretical approach to focus attention on important concepts and skills to create a more efficient leadership development process requires further evaluation.

**Assessing Students' Impressions of the Cultural Awareness of College of Pharmacy Faculty and Students.** Nicholas G. Popovich, *University of Illinois at Chicago*, Clara U. Okorie-Awe, *University of Illinois at Chicago*, Stephanie Y. Crawford, *University of Illinois at Chicago*, Rosalyn P. Vellurattil, *University of Illinois at Chicago*, Fabricio E. Balcazar, *University of Illinois at Chicago*, Terry W. Moore, *University of Illinois at Chicago*, Allison E. Schriever, *University of Illinois at Chicago*. **Objectives:** To determine pharmacy students' impressions of their faculty's interactions with diverse student and patient populations. **Method:** Three student focus groups were convened, i.e., fourth-year pharmacy students (P4), third-year pharmacy students (P3), and a combined group of second- and first-year pharmacy students (P2 and P1) at a Midwestern pharmacy college. Confidential focus groups were facilitated by an external faculty member and conducted away from the college of pharmacy. Three faculty investigators independently coded the 84 transcript pages and met together (in a series of meetings) to compare codes and identify major themes. Emergent themes were identified by qualitative analysis. **Results:** Students defined diversity as multidimensional beyond traditional categories. Four emergent themes were identified: 1) awareness or lack of awareness of cultural diversity among faculty, 2) disparate cultural perspectives and preferences within student groups, 3) teaching and learning approaches to prepare students to be more culturally competent, and 4) student group dynamics. Among these themes, the P1-P2 focus group emphasized more on student-to-student interactions. Further, the P4 and P3 focus groups emphasized a lack of preparation for the realities of contemporary practice based on instructional methods. **Implications:** Students desire to integrate the curriculum with contemporary pharmacy practice in a diverse, multicultural

society. An unexpected outcome was how participating students view other students' actions and words relating to cultural awareness. Facilitated critical dialogue among student groups will help to bridge perceived differences and enhance student group relations. Student recommendations will improve curricular offerings and the cultural awareness of faculty and students.

**Assessment of Motivational Interviewing Training Utilizing Blended Learning.** Michael Biddle, *Idaho State University*, Rebecca Hoover, *Idaho State University*. **Objectives:** The primary objective was to assess third-year pharmacy students' abilities to recognize and formulate responses using motivational interviewing (MI) skills after a semester of motivational interviewing training using an online, self-study training program supplemented with in-class practice activities. **Method:** The semester-long MI training consisted of 6 online learning modules (8 hours total), six hours of live laboratories, and one videotaped session. Students took a 28-item pre-class and 33-item post-class survey. Twenty questions assessed students' abilities to recognize and formulate statements using MI skills. Differences in the pre- and post-class assessment were tested for significance using a 2-sided student t-test. Students were required to complete the assessments for course participation credit, but their responses were de-identified and had no impact on their overall course grade. **Results:** The average score on the 20-question pre- and post-class assessments were 41% and 86% respectively (p<0.05). **Implications:** Motivational interviewing training can be a time-intensive processes. Combining an online, self-study program supplemented with in-class practice activities is an effective method for teaching pharmacy students motivational interviewing skills.

**Associations Between Cognitive Style Indicator and Caring Ability Inventory of First-Year Pharmacy Students.** David A. Gettman, *D'Youville College*. **Objectives:** The primary objective was to explore relationships between cognitive style and caring ability of first-year pharmacy students. The secondary objective was to determine if age and gender were also associated with these relationships. **Method:** This cross-sectional study utilized student volunteers in a 1st year health care delivery course. Volunteers filled out an anonymous online Qualtrics survey. The 3 part survey consisted of (1) the 18-item Cognitive Style Indicator (Cools and Van Den Broeck, 2007), (2) the 37-item Caring Ability Inventory (Nkongo, 1990), and (3) questions on age and gender. Descriptive statistics, correlations, and regression analyses were conducted using SPSS Version 23. **Results:** 64 subjects responded (98% response rate). 21.9 was the average age; and, 39 subjects were female. The means for the 3 cognitive style indicator subscales were 16.9 for knowing style, 30.1 for planning style, and 26.3 for creating style. Furthermore, the means for the 3 caring ability inventory subscales were 79.0 for knowing, 64.3 for courage, and 60.0 for patience. Significant correlations were found between the knowing style subscale of the cognitive style indicator, and both the knowing subscale and patience subscale of the caring ability inventory. **Implications:** Assessing student achievement of the CAPE Domain 4 is currently a major focus of pharmacy education. This study focused on relationships between students' cognitive style indicator (knowing, planning and creating) and students' caring ability inventory (knowing, courage, and patience). Students' self-awareness of these critical abilities, beliefs, biases, motivation, and emotions can enhance or limit their personal and professional growth.

**Comparison of Polypharmacy Medication Adherence Simulation in Professional Pharmacy Students Versus Undergraduate Students.** Teresa Nguyen, *The University of Texas*, Karen L. Rascati,

*The University of Texas at Austin*, Holli Temple, *The University of Texas at Austin*. **Objectives:** To compare reported medication adherence rates, perceived barriers, and methods used to increase adherence between undergraduate students and pharmacy students based on a medication-taking simulation course. **Method:** In Spring semesters of 2014 and 2015, students in both a pharmacy course and an undergraduate seminar participated in a short simulation involving a complicated polypharmacy regimen. Within one week of participating in the simulation activity, the students answered survey questions about the assignment through an online course sharing platform. **Results:** All students enrolled in the courses (237 pharmacy students and 34 undergraduate students) completed the assignment. A large percentage of each group reported some non-adherence; 95% (225/237) of first-year pharmacy students and 82% (28/34) of undergraduate students. The top two barriers reported were 1) simply forgetting and 2) difficulty following the food/alcohol related restrictions associated with some of the medications. The top two methods used to increase adherence were phone/electronic reminders and paper/spreadsheet reminders. **Implications:** Pharmacy students reported lower adherence to a polypharmacy regimen than undergraduate students. The most common reasons for non-adherence and most common methods used to increase adherence were similar between the two cohorts.

**Developing Consensus on Quality Indicators for Team-Based Learning Application Activities in Pharmacy Education.** Kristin K. Janke, *University of Minnesota*, Robert Bechtol, *University of Minnesota*, Gardner A. Lepp, *University of Minnesota*, Stephanie F. James, *Regis University*, Peter Clapp, *Regis University*. **Objectives:** To determine quality indicators of pharmacy team-based learning (TBL) application activities (AAs). **Method:** A two-round modified Delphi process with pharmacy TBL experts was conducted. Twenty-three panelists met the inclusion criteria, including having at least four years of TBL experience, designing at least eight TBL sessions, training others to use TBL, and authoring a peer-reviewed TBL pharmacy paper. In Round 1, twenty panelists (87% of eligible) responded to six open-ended questions about their most successful TBL AAs, including satisfaction with and quality of the activity and methods for creating positive student outcomes. In Round 2, seventeen panelists (85% participation) indicated their level of agreement with the quality indicators identified from Round 1 using a 4-point Likert rating (i.e. strongly disagree, disagree, agree, strongly agree). Consensus was set at 80% strongly agree/agree (SA/A). In an open comment period, fifteen panelists provided suggestions to help expand the descriptions of the indicators. **Results:** Sixteen (16) quality indicators were identified in Round 1 with 14 achieving consensus in Round 2. "Uses authentic pharmacy challenges or situations" (85% SA/A) and "incorporates or provides effective feedback to groups" (88% SA/A) met consensus. However, "has multiple right answers" (76% SA/A) and "incorporates elements from school specific emphases (e.g. faith, underserved)" (53% SA/A) did not reach consensus. **Implications:** Strong AAs help students to develop higher order thinking skills and provide practice solving authentic problems. These indicators can be used to evaluate AA quality, including the effects of training, checklists and peer review on the quality of AAs developed.

**Developing Interprofessional Communication Skills Through Pre-Clinical Interprofessional Education Experiences.** Palak Desai, *Western University of Health Sciences*, Baiyang Zhang, *Western University of Health Sciences*, JaeJin An, *Western University of Health Sciences*, Jasmine Yumori, *Western University of Health Sciences*. **Objectives:** To evaluate interprofessional communication skills before and after completing an interprofessional education

course among the 2nd year pre-clinical health profession students. **Method:** A survey was designed and delivered electronically to all students enrolled in an interprofessional education course. Students completed the survey at the beginning of the Fall 2015 semester, before the interprofessional education course started, and at the end of the Spring 2016 semester, after the course ended. Mean and standard deviation for each item in the survey was calculated and pre- and post-course survey results were compared using a paired t-test. Stratified analysis was conducted by each college. Data was further analyzed using Cohen's D effect size to quantify the changes before and after the course. **Results:** Survey results from 117 pharmacy and 632 non-pharmacy health professional students (results analyzed per college) were included in analysis. A statistically significant overall improvement in verbal and written communication skills after the course was identified for students from almost every college, including pharmacy. Effect sizes ranged from 0.6 to 1.0, with 0.6 for pharmacy students, which indicate large changes for all colleges. Overall, students felt increased competence and confidence in written, electronic, and verbal communications when responding to conflict. **Implications:** Pre-clinical interprofessional education courses may improve verbal and written communication skills for pharmacy and other health professional students.

**Do Stress and Satisfaction Drive Professionalism in PharmD Students?** Casey R. Tak, *The University of Utah*, Michael Feehan, *The University of Utah*, Mark A. Munger, *The University of Utah*. **Objectives:** A guiding principle of pharmacy professional educational programs is to inculcate a high degree of professionalism among students - a "habitus professionalism." A previous analysis of first year PharmD students showed marked reductions in stress and increases in satisfaction through curricular change. However, it is unknown how these changes affect professionalism. We are modeling the relationship between stress and satisfaction with the PharmD program, and how these impact the professionalism in PharmD students. **Method:** The PharmD program at the University of Utah conducts annual surveys of its PharmD student body. These surveys gauge multiple dimensions of student professionalism: personal reflection, patient-centric care focus, cultural competency, interprofessional learning, etc. The surveys also gauge the level of stress and burnout experienced by students and their satisfaction with the program's teaching and administration. Data are available for 2015 (n= 166) and 2016 (n=200). Advanced hierarchical structural equation modeling is used to analyze the relationships between stress, satisfaction, and professionalism. **Results:** Provisional analyses showed a strong inverse relationship between stress and satisfaction; satisfaction was a more important predictor of professionalism than stress. **Implications:** These findings may have direct implications for faculty who guide professional students' development as they factor in students' perceived well-being as a mediator of their program's effectiveness in inculcating professionalism.

**Entrepreneurship Education Opportunities for Student Pharmacists.** Ashley N. Hannings, *The University of Georgia*, Justin Drew, *The University of Georgia*, Taylor Mitchell, *The University of Georgia*, Carson Ray, *The University of Georgia*, Tyler Young, *The University of Georgia*, Matt Lastinger, *The University of Georgia*. **Objectives:** To characterize entrepreneurship and business management education opportunities in pharmacy schools across the United States. **Method:** A survey consisting of 17 questions was emailed to the Associate Dean for Academics (or equivalent) at colleges of pharmacy identified using the AACP directory. The question format ranged from multiple choice, select all that apply, to open-ended style. The questions were designed to obtain demographics about the college, as

well as describe how entrepreneurship and business management opportunities were incorporated into the curriculum. Participants were also allowed to provide an email address for follow-up questions if desired. **Results:** A total of 116 requests were emailed with a response rate of 28%. All schools reported incorporating entrepreneurship into lectures or activities in required courses. Other responses included guest speakers (81%), student organizations (78%), elective courses (63%), advanced pharmacy practice experiences (56%), conferences outside of school-sponsored events (41%) and introductory pharmacy practice experiences (31%). Of the respondents, 16% reported having an entrepreneurship certificate program and 56% offer dual Pharm.D./MBA programs. 38% of responding schools stated that they have resources available for students who want to own their own business after graduation. **Implications:** All responding schools incorporate entrepreneurship into their curriculum at some level. Methods for content delivery vary from program to program, as do additional opportunities to develop entrepreneurial skills. In addition, while all responding schools expose their students to entrepreneurship concepts, less than half of respondents offer resources to graduates with interest in this field.

**Evaluating a Global Measure of the Research Training Environment in Pharmacy Residents.** Spencer E. Harpe, *Midwestern University/Downers Grove*, Kara Sermersheim, *Midwestern University/Downers Grove*. **Objectives:** To examine the internal consistency of a modification to the short form of the Research Training Environment-Revised (RTES-R-S) instrument in pharmacy residents **Method:** The 18 items of the RTES-R-S instrument were originally developed to measure the research training environment in doctoral psychology programs. Although the developers recommended it be used as a single, global measure, two subscales were proposed. The RTES-R-S wording was modified to be relevant for residency training (e.g., changing “dissertation” to “residency project”). A group of residents and preceptors reviewed the wording changes for appropriateness. The modified instrument was administered online to a sample of residents who presented at the Great Lakes or Mid-South residency conferences. Cronbach’s alpha was used to assess internal consistency of the global measure and the two subscales. **Results:** The 167 responding residents (35% response rate) were primarily Caucasian, female, and from the Great Lakes region with mean (SD) age of 26.8 (3.2) years. Responses were approximately evenly distributed between PGY1 and PGY2 programs with almost 75% being from health-system pharmacy or clinical specialty residencies. Cronbach’s alpha for the overall scale was 0.80. Interpersonal and instructional subscale alphas were 0.67 and 0.64, respectively. **Implications:** The research training environment has been shown to be an important predictor of research engagement and productivity. In its recommended form, the modified RTES-R-S demonstrated acceptable internal consistency in this sample of pharmacy residents. Internal consistency for the subscales, however, did not meet commonly used standards. Future research should examine the factor structure of the RTES-R-S in pharmacy residents.

**Evaluation of Medication Safety and Dispensing Skills in Pharmacy Students.** Connie F. Rust, *South College*, Brian D. Esters, *South College*, Jwala Renukuntla, *The University of Texas at El Paso*, Laura Shalilol, *South College*, Maria Baranova, *South College*. **Objectives:** The purpose of this exploratory study was to evaluate pharmacy students’ levels of confidence in medication safety and medication dispensing skills prior to and upon completion of the first year of a two year longitudinal dispensing lab in an accelerated pharmacy program. **Method:** The Medication Safety and Dispensing Skills Confidence Survey was administered to student pharmacists prior to the introduction

of the longitudinal dispensing lab and upon completion of the first year. The survey is a 2-domain (Medication Safety and Dispensing Skills), 14 item questionnaire developed based on the learning and outcome objectives of the IPPE and APPE rotations of the SCSOP curriculum. Total scores range from 14-56 and scores of each domain range 7-28. The longitudinal lab was incorporated into the existing pharmacy practice curriculum and a co-curricular collaboration with the pharmaceutical sciences department. **Results:** The survey was completed by 79 students. Analysis of paired samples t-tests indicated a significant difference in the means of pre ( $M=19.08$ ,  $SD= 4.69$ ) and post ( $M=22.68$ ,  $SD= 3.30$ ) scores for overall confidence [ $t= 8.27$ , sig (2-tailed)  $<.05$ ] as well as both medication safety skills and dispensing skills. **Implications:** Results of the study indicate a positive effect of medication safety and dispensing skills training in a longitudinal lab on student confidence in utilizing these skills. It is imperative that pharmacy students leave the didactic portion of their education equipped with the necessary pharmacy skills, however basic, and the confidence to use them.

**Examining the Attitudes Towards the Use of Marijuana in a Cohort of Pharmacy Students.** Rutugandha Paranjpe, *University of Houston*, Precious Anyanwu, *University of Houston*, Sujit Sansgiry, *University of Houston*. **Objectives:** The study aim was to evaluate if prior consumption of marijuana for medicinal and/or recreational purposes by pharmacy students affects their attitude towards marijuana use. **Method:** An online survey was distributed to a cohort of pharmacy students at a University in Texas. The survey contained questions on attitude towards marijuana use, prior use of marijuana, and sample characteristics. Attitude was measured using a 9-items 5-point Likert scale. Scores were recoded to provide an average attitude toward marijuana use score where 5 indicated a favorable attitude and 1 an unfavorable attitude. Differences in mean attitude scores between past marijuana users and non-users was evaluated using student’s t-test. **Results:** The sample consisted of 277 students (Response rate 72.5%). The mean age was  $24.21 \pm 3.14$  with 182 (66.18%) females. Around a third of the sample ( $n=72$ , 30%) indicated using marijuana either for recreational and/or medicinal purposes, where 68 (24.3%) indicated use for recreational purposes and while 24 (8.6%) indicated use for medicinal purposes. The Cronbach’s alpha for the 9-item scale used to measure attitude towards marijuana use was 0.91. Participants who consumed marijuana had a mean attitude score significantly higher ( $4.11 \pm 0.6$ ), compared to those who did not use ( $3.24 \pm 0.77$ ) ( $P<0.001$ ). **Implications:** Pharmacy students who had consumed marijuana previously maintained a more favorable attitude towards marijuana use while those who did not, had a lower, yet favorable attitude. Future studies should evaluate the role of state laws and its effect on attitude towards marijuana use with pharmacy students.

**Exploring Student and Grader Satisfaction: Integrating Computer-Based Assessments for Clinical Skills Exams.** Channing Ford, *Auburn University*, Erika L. Kleppinger, *Auburn University*, Amber M. Hutchison, *Auburn University*. **Objectives:** The role of Standardized Patients (SPs) in the pharmacy curriculum expands as more programs move towards Objective Structured Clinical Examinations (OSCEs). Quick performance feedback is challenging and requires SPs to have access to appropriate software. This study examined student and grader satisfaction with the transition from paper-based to computer-based assessments. **Method:** In fall 2014, the Harrison School of Pharmacy adopted ExamSoft, a web-based assessment software, transitioning OSCE performance grading from paper to computer. This change required additional SP training and OSCE personnel recognized the need to assess student and SP satisfaction.

**Results:** 438 students (96% response rate) completed the survey; 58% indicated that OSCE results were available sooner than in previous years. ANOVA findings determined significant differences between professional years for three items: access to ExamSoft rubrics helped understand grading ( $p < .001$ ); gathering materials for OSCE review helped identify areas for improvement ( $p < .001$ ); and helpful that test results were available in one location ( $p < .001$ ). Students earlier in their program were more likely to agree with survey statements than students in later years. 14 SPs (56% response rate) completed the survey, all indicating they were comfortable using a computer. All agreed that grading on ExamSoft was easier than grading on paper. **Implications:** Students and SPs transitioned well to web-based assessments. Students liked that feedback was provided quickly and efficiently and that the information remained in their assessment portal throughout their program. It was also determined that additional SP training was needed prior to OSCEs to refresh understanding of the assessment software.

**First Generation College Students' Demographic, Socio-Economic Status and Academic Performance in Pharmacy School.** Serge Afeli, *Presbyterian College*, Tynessa A. Houchins, *Presbyterian College*, Nieka S. Jackson, *Presbyterian College*, Jacqueline Montoya, *Presbyterian College*. **Objectives:** Identify the demographic, socio-economic status, and academic performance of first generation college students (FGCS) enrolled in pharmacy schools. Investigate the needs and explore the strengths of available resources to support FGCS during their tenure in pharmacy school. **Method:** Data were collected via an anonymous survey using the online software developed by Qualtrics. The target population was students enrolled at colleges and schools of pharmacy in the United States. The survey questions had four different categories including demographics and socio-economic status, commitment to the profession, strength of institutional support, and students' school experience. No individual responses were assessed; results were made anonymous and analyzed in aggregate. **Results:** FGCS in pharmacy school are predominantly Caucasians or Whites (57.9%), Asian descents (19.0%), Latinos or Hispanics (12.6%); and Blacks or African Americans (7%). The percentage of FGCS from families earning less than \$23,050 per year was three times higher (15.5%) than their non-FGCS (NFGCS) counterparts (5.9%). Both FGCS and NFGCS were equally committed to complete their doctor of pharmacy degree and had almost similar academic success as illustrated by their grade point average. Our study points to an implicit lack of institutional support for FGCS enrolled in pharmacy school. **Implications:** There is virtually nonexistent literature on FGCS enrolled in schools and colleges of pharmacy. The United States is rapidly becoming a more racially and ethnically diverse nation, therefore, it is critical that new strategies be designed to bring a stronger representation of minority groups in the field of pharmacy for the years to come.

**First-Year Pharmacy Students' Contraception Knowledge, Perceptions, and Counseling Intentions.** Natalie Hohmann, *Auburn University*, Jan Kavookjian, *Auburn University*. **Objectives:** Recent policy changes allow pharmacists in some states to independently prescribe hormonal birth control and emergency contraception, which may impact women's health curricula in schools of pharmacy. However, the current state of pharmacy students' contraception knowledge, perceptions, and counseling intentions is unclear. This study evaluates first-year pharmacy students' contraception knowledge, perceptions, and counseling intentions. **Method:** A cross-sectional survey was developed to assess contraception knowledge, perceptions, and counseling intentions using five constructs from the Theory of Planned

Behavior (knowledge, attitudes, subjective norms, perceived behavioral control, and intention). True/False questions were used for the knowledge scale and 5-point Likert-type items for the remaining scales. In Fall 2016, first-year pharmacy students consenting to participate in a longitudinal study were recruited in person and via an online learning management system used for a patient-centered skills course. Descriptive statistics and Pearson correlations between summed scale scores were assessed. **Results:** 110/112 eligible students responded (98.21% response rate). Mean scale scores for knowledge, attitudes, subjective norms, perceived behavioral control, and intention were 76.55% (+/-20.43%), 87.96% (+/-12.40%), 63.89% (+/-8.06%), 58.98% (+/-10.46%), and 81.39% (+/-12.87%), respectively. Attitudes ( $r = 0.497$ ,  $p < 0.01$ ) and subjective norms ( $r = 0.197$ ,  $p = 0.039$ ) were statistically significantly correlated with counseling intention. Other correlations were not statistically significant. **Implications:** Pharmacy school curricula that teach students methods to overcome perceived barriers to contraception counseling may lead to improved future pharmacist intention to approach patients about women's health issues. Ongoing policy changes present opportunities to expand the role of the pharmacist and to improve patient access to women's health professionals.

**Health Practices and Perceptions on Lifestyle Counseling Among Student Pharmacists.** W. Cheng Yuet, *University of North Texas System*, Esther Galadima, *UNT School of Public Health*, Jenny Lee, *Texas College of Osteopathic Medicine*. **Objectives:** To determine health status, health practices, and perceptions on lifestyle counseling among student pharmacists. **Method:** A survey was administered to all students in a PharmD program at a public university. The questionnaire consists of three distinct areas: 1) personal characteristics, 2) health behaviors, and 3) and opinions on lifestyle counseling. Descriptive and inferential statistics were performed to characterize health practices and identify trends of change over time, respectively. An a priori level of significance was set at 0.05. **Results:** A total of 93 students completed the survey; 53 (57%) females, 39 (41.9%) non-Hispanic whites, and age  $27.7 \pm 5.15$  (mean  $\pm$  SD) years. Of all respondents, 38 (41.3%) had a BMI classified as either overweight or obese. Most students (82.3%) reported their overall health to be good, very good, or excellent. Females reported more sleep compared to males ( $6.81 \pm 1.04$  hours vs.  $6.38 \pm 1.05$ ,  $p < 0.05$ ). Most students (81%) do not identify as current or former smokers. Students report that counseling patients on nutrition, exercise, and weight management is somewhat or highly relevant to their intended practice compared to topics such as hormone replacement therapy or safe sex which are not at all relevant to their intended practice ( $p < 0.05$ ). **Implications:** Student pharmacists reported good health practices in comparison to other adults in the United States. However, there are several areas of lifestyle counseling that student pharmacists may deem irrelevant to their intended practice.

**Identifying Essential Teaching Qualities and Behaviors in Pharmacy Faculty to Effectively Reach Students.** Channing Ford, *Auburn University*, Kristen L. Helms, *Auburn University*. **Objectives:** The role of teaching in academic pharmacy continues to evolve as ACPE standards and student expectations change. However, faculty do not always recognize that to maintain best teaching practices they must be aware of how their teaching pedagogy impacts the learning environment. The goal of this study was to determine if student pharmacists and faculty identify the same teaching qualities/behaviors as essential to effective teaching. **Method:** Two hundred and eleven pharmacy faculty and 213 student pharmacists completed an anonymous survey asking them to identify 10 out of 28 qualities/behaviors



essential to teaching. Faculty participants held teaching or instructor/facilitator appointments at 1 of 10 Southeastern Athletic Conference (SEC) schools. Student participants were completing P1, P2, or P3 years within 1 of 4 SEC institutions. **Results:** Descriptive statistics showed commonality between faculty and students for 6 of the top 10 qualities/behaviors (approachable/personable; confident; effective communicator; enthusiastic about teaching/topic; knowledgeable about subject matter; and respectful). However, for the remaining top four, faculty preferred items reflective of classroom behaviors, while students preferred items associated with a faculty member's ability to relate to students' learning needs. Further analysis (ANOVA) found significant differences between faculty and students for 15 qualities/behaviors ( $p < 0.05$ ); the non-parametric chi-square test determined that 25 of the 28 items were significant ( $p < 0.05$ ). **Implications:** Students and faculty share similar expectations regarding effective teaching behaviors/qualities that will help them succeed in the classroom. However, their differences could dramatically impact the learning environment. The relationship between a faculty member and student is essential for the future of pharmacy education.

**Impact of Participating in a Pharmacy Camp on High School Students' Perceptions of Pharmacy.** Stephanie M. Cailor, *Cedarville University*, Aleda M. Chen, *Cedarville University*. **Objectives:** To determine if pharmacy camp changes high school students' 1) perceptions of pharmacy and 2) decisions about pharmacy as their future career choice as well as 3) to assess high school students' perceptions of pharmacy camp. **Method:** High school students interested in pharmacy attended a 5-day pharmacy camp. Students participated in activities, such as compounding, introduction to hypertension and diabetes, physical assessment, and tours of pharmacies and manufacturers, and interacted with pharmacy faculty and students. After IRB approval, 3 years of attendees ( $N=29$ ) completed a survey (5 demographic items; 7 Perceptions items, 7-point Likert-type; 4 Future Career Choices items, 7-point Likert-type; 6 additional post-survey items, 7-point Likert-type) pre-post camp week. **Results:** There were significant changes on 2 perceptions items, including improvements in the perception that pharmacists' career options include more than retail ( $p < 0.001$ ). There was significant improvement on 1 Future Career Choices item; students left camp with stronger agreement that they could explain the roles of a pharmacist to another individual ( $p = 0.002$ ). No significant change was seen in students' desire to attend the university offering the camp for pharmacy school ( $p = 0.861$ ). Students agreed that meeting with pharmacy faculty (Mean  $\pm$  SD =  $6.28 \pm 0.797$ ) and students (Mean  $\pm$  SD =  $5.90 \pm 1.263$ ) helped them decide if pharmacy was the career for them. **Implications:** Attending pharmacy camp may not have an impact on a high school students' desire to attend a particular university for pharmacy school, but may improve their perceptions of the career of pharmacy.

**Impact of a Birkman Method® Intervention on Pharmacy Preceptor and Faculty Self-Awareness and Self-Confidence.** Stephanie Shealy, *University of South Carolina*, Jennifer Baker, *University of South Carolina*, Cathy L. Worrall, *Medical University of South Carolina*, Amy D. Grant, *University of South Carolina*, Patti Fabel, *University of South Carolina*, Bryan Ziegler, *University of South Carolina*, Whitney Maxwell, *University of South Carolina*. **Objectives:** To determine the change in self-awareness and self-confidence among preceptor and faculty members at the South Carolina College of Pharmacy (SCCP) upon implementation of a Birkman Method® assessment and training. **Method:** SCCP rotation preceptors and faculty members were recruited to participate in the Birkman Method® intervention. The intervention involved completing a pre-intervention survey, tak-

ing the Birkman Method® assessment, reviewing the results, attending a 2-hour live training from a certified Birkman training consultant and completing a post-intervention survey. The pre- and post-surveys were identical with the exception of a question that referred to future utilization of results. The pre- and post-surveys were compared for each participant to determine changes in self-confidence and self-perception accuracy. **Results:** Both groups had statistically significant increases in self-perception accuracy, which was used as a marker of self-awareness changes. With a maximum self-perception accuracy score of 6 points, faculty members experienced an average increase in self-perception accuracy of 1.20 points ( $p = 0.0020$ ) and preceptors experienced an average increase of 1.77 points ( $p < 0.0001$ ). **Implications:** Implementation of the Birkman Method® program at South Carolina College of Pharmacy facilitated increases in self-awareness among faculty and preceptors. Further analysis will determine longitudinal effects, but these results provide promising indications that through the implementation of a standardized professional development program, PharmD programs can create a culture among students, faculty, and preceptors that is dedicated to increasing self-awareness.

**Impact of an In-Lab Honor Code Statement on Pharmacy Students' Academic Honesty.** Norman Fenn, *Purdue University*, Taylor M James, *Purdue University*, Bin Deng, *Purdue University*, Kimberly S. Plake, *Purdue University*. **Objectives:** 1. Identify areas in a curriculum to address academic honesty. 2. Describe an academic honesty system (or HCS) to reduce dishonesty and enhance student knowledge. **Method:** Methods: At the Purdue University College of Pharmacy, each class of students ( $N=150$ ) are divided into smaller groups ( $N=32$ ) to participate in the professional skills laboratory. Students participate in one laboratory per week, so the activities performed in the Monday laboratory are the same for the Friday laboratory. Students with laboratories earlier in the week may discuss activities with peers with laboratories later in the week, creating inequities in the laboratory experience. For this study, 150 third-year pharmacy students were issued an Honor Code Statement (HCS) as part of their laboratory grade. A subsequent anonymous 18-question survey was distributed by an independent third party to the pharmacy students, with a group incentive offered if at least 80% responded to the survey. The survey items focused on their current behaviors and attitudes toward academic dishonesty and the influence of the HCS on their behaviors. Descriptive statistics and nonparametric statistical tests were performed. **Results:** Results: The HCS was completed by 100% of students. Approximately 67% of the class responded to a follow-up survey on the impact of the HCS. There were statistically significant differences when evaluating the impact of the HCS in regards to discussion behavior with classmates and the resulting consequences of breaking the HCS. **Implications:** Conclusion: Results suggest that HCS can positively influence students' understanding of and behaviors regarding academic dishonesty.

**Implementation and Assessment of Using Patient Cases to Teach Patient Quality of Life Issues.** Juanita A. Draime, *Cedarville University*, Emily Laswell, *Cedarville University*, Aleda M. Chen, *Cedarville University*. **Objectives:** As part of the Pharmacists' Patient Care Process, patient quality of life (QOL) preferences must be collected and evaluated before creating a patient-centered plan. Thus, the objectives of this project were to determine (1) if performance in a QOL activity is impacted by its design and (2) student perceptions of a case-based, innovative educational activity. **Method:** Two student cohorts presented a journal article in small groups that examined a QOL aspect. The next two cohorts read a published case report with a QOL issue and presented the issue and a patient-centered solution using a modified

SBAR (Situation, Background, Assessment, Recommendation) technique in small groups. Student presentations were assessed using similar rubrics, which was examined retrospectively using an unpaired t-test to examine iteration differences. Students in the final cohort also were surveyed on their perspectives of the case-based project; descriptive statistics and thematic analyses were performed. **Results:** Those completing the case-based activity (N=71) had significantly higher rubric scores than the journal (N=98) presentation ( $95.62 \pm 5.47$  vs.  $86.30 \pm 16.54$ ,  $p < 0.001$ ). Students who were surveyed (N=34) believed that they made moderate to exceptional progress in explaining QOL (85%) and the activity was useful (80%). A predominant qualitative theme was a gain in understanding the patient's perspective. **Implications:** Pharmacy students must understand how different disease states impact a patient's QOL, in order to collaboratively and compassionately create a patient-centered care plan. Assignments, such as this case-based activity may assist in this process.

**Implementation and Evaluation of a Hybrid Class in Health Care Systems.** Scott A. Baggary, *The University of Louisiana at Monroe*, Jeffery D. Evans, *The University of Louisiana at Monroe*, Michelle O. Zagar, *The University of Louisiana at Monroe*, Gregory W. Smith, *The University of Louisiana at Monroe*. **Objectives:** To implement a mixed self-study/live lecture format Health Care Systems course, determine if students have self-assessed changes in perceived knowledge, and to determine if differences exist in knowledge estimates and assessment outcomes between self-study and live lecture sections. **Method:** Course objectives were aligned with ACPE Appendix 1 requirements. Consenting students in second-year Health Care Systems courses in 2015 and 2016 completed pre/post course surveys rating their perceived knowledge about course objectives using a 5-point scale (1=no knowledge; 5=excellent knowledge). Pre- and post-knowledge estimates were compared statistically between years using Wilcoxon rank-sum tests and within years using Wilcoxon signed-rank tests. Assessment outcomes were compared between years using two-sample t-tests and within years using paired t-tests. **Results:** Complete data were available for 61 students in the 2015 class and 25 students in the 2016 class. No significant differences existed for knowledge estimates or assessment outcomes between classes; therefore, data were pooled for further analysis. Median knowledge estimates increased for both self-study (pre=2.0; post=3.0;  $p < 0.001$ ) and live lecture (pre=2.0; post=4.0;  $p < 0.001$ ) sections. Median post-course knowledge estimates were higher for live lecture than self-study sections (4.0 vs 3.0;  $p < 0.001$ ). Assessment outcomes did not differ between self-study and live lecture sections (90.01% vs 87.67%;  $p = 0.3283$ ). **Implications:** Self-directed learning led to statistically significant positive changes in self-assessed knowledge. Though live lectures showed a higher level of perceived knowledge, there was not a correlation to performance on quizzes. In this case, self-directed learning increased course assessed knowledge as well as lecture-based learning, with fewer faculty assets used.

**Improving Care for Victims of Intimate Partner Violence: Preparing Student Pharmacists to Serve.** Marie Barnard, *The University of Mississippi*, Alicia S. Bouldin, *The University of Mississippi*. **Objectives:** Intimate partner violence (IPV) is a serious public health problem. Previous research found few pharmacists receive training about IPV. This is unfortunate as pharmacists are accessible healthcare providers and are trained to engage in counseling and health education initiatives. Additionally, IPV has been shown to negatively impact medication adherence. To educate pharmacists about IPV and to enhance their awareness of victims' needs, incorporation of a module on IPV in the pharmacy curriculum may be helpful. This pilot study

evaluated the baseline readiness of pharmacy students to manage IPV and to determine if a brief IPV training module would increase readiness. **Method:** Students in a professional pharmacy program (n=108) completed a validated measure, Physician Readiness to Manage Intimate Partner Violence Survey (PREMIS) minimally adapted for use with pharmacy students, before and after an IPV training module. **Results:** Most (90.7%) reported that they had no prior IPV-related training. Despite this, students had high levels of knowledge related to risks associated with IPV, most appropriate methods to ask about IPV, and IPV-related injury. There were no significant differences between pre- and post-training assessments. **Implications:** Exposure to IPV training is not a standard component of most pharmacy education programs. This study found that students already had high levels of IPV-related knowledge. Students reported significant interest in the topic, requested additional guidance on providing referrals, and demonstrated interest in how to serve as effective advocates for IPV-exposed patients. Including IPV-related training in pharmacy schools has the potential to significantly improve care for IPV victims.

**Influence of the Fear of Missing Out (FoMO) in Student Pharmacists' Decision to Pursue Residency Training.** Ashley S. Crumby, *The University of Mississippi*, Alicia S. Bouldin, *The University of Mississippi*, Meagen M. Rosenthal, *The University of Mississippi*, John P. Bentley, *The University of Mississippi*, David F. Gregory, *The University of Mississippi*. **Objectives:** To examine the influence of Fear of Missing Out (FoMO) on student pharmacists when making postgraduate career decisions, including whether to pursue a residency. **Method:** Data collection involved survey self-report (mixed mode approach) among student pharmacists (P2-P4) at four participating universities, to identify postgraduate residency intentions as well as the motivators and barriers associated with this choice. The survey included a 14-item FoMO scale designed to examine the influence of this factor in the residency decision. **Results:** 42% indicated an intention to pursue residency training; the desire to gain experience was identified as the main motivating factor driving this decision. Other important motivating factors included anticipated job satisfaction, the desire to gain knowledge and specialized training, and the desire for a competitive advantage in the job market. Of the 58% of students indicating no intention to pursue a residency, the most influential barrier was availability of an existing job that did not require extra training. Other barriers included the delay of full-pharmacist salary, student loan debt, and pharmacy school burnout. When considering the influence of FoMO, results indicate that the phenomenon is present in this educational setting, with FoMO scores higher among student pharmacists in the fourth year of the curriculum. **Implications:** This study identified additional motivators and barriers to residency training, beyond those examined in previous research. One such influencing factor is FoMO, although more research and scale refinement is needed in future studies to better identify the impact of this phenomenon on career choice in this population.

**Integration of Multi-Disciplinary Concepts to Enhance Non-Seasonal Vaccinations: We Immunize Training Program.** Tessa J. Hastings, *Auburn University*, Lindsey Hohmann, *Auburn University*, Stuart J. McFarland, *Auburn University*, Kimberly B. Garza, *Auburn University*, David Ha, *Keck Graduate Institute*, Sally A. Huston, *Keck Graduate Institute*, Salisa C. Westrick, *Auburn University*. **Objectives:** Pharmacists and pharmacy technicians are in need of practical guidance on how to incorporate non-seasonal vaccination services into day-to-day workflow. Therefore, the objectives were to develop and evaluate the We Immunize Training Program to enhance pharmacy-based pneumococcal and herpes zoster vaccination services. **Method:**

The We Immunize Training Program was an online, ACPE-accredited two hour continuing pharmacy education (CPE) course that was delivered in summer 2016. Developers were experts in infectious disease, communication, behavioral economics, and change management and used these principles as guidance to create practical strategies to support pharmacists and pharmacy technicians in marketing services, patient interaction, and service implementation. A post-program assessment included demographic information, attitudes toward the training program and motivational factors. **Results:** Thirty participants (18 pharmacists and 12 pharmacy technicians) completed the program. The greatest proportion believed that practical strategies gained from this course would help them positively impact their patients. The majority indicated that training content was clear and concise (86.7%), relevant to practice (90.0%), realistic time was allowed (70.0%), and the course site was easy to navigate (80.0%). The most important factor in motivating participants to complete the course was that it was offered at no cost, followed by convenience of the online platform, and need for CPE hours. **Implications:** Immunization training focused on practical application in patient care may provide unique value to pharmacists and pharmacy technicians. Future research is needed to evaluate practice changes beyond participants' perceptions and if effective, consideration of integration as an addition to immunization certification training.

**Leveraging Behavioral Economics-Based Interventions to Improve Medication Adherence.** Justin K. Owensby, *Auburn University*, Kimberly B. Garza, *Auburn University*, Richard Hansen, *Auburn University*, Brent Fox, *Auburn University*, Ana Franco-Watkins, *Auburn University*. **Objectives:** To determine the relative effectiveness of behavioral economics-based interventions using financial or social incentives. **Method:** Pilot randomized controlled trial comparing the effects of financial v. social incentives v. usual care on medication adherence in patients taking anti-hypertensives or anti-hyperlipidemics. Baseline survey assessed self-reported adherence, socioeconomic status, and perspectives of differing incentives. Participants received either usual care(UC), financial incentives(FI), or social incentives(SI). Daily adherence was measured over a 90-day period using MEMS caps. The FI group received \$90 upfront, with \$1 deducted each day a dose was missed. The SI group utilized a study website that displayed individual and group medication adherence for participants to see. The UC group were instructed to take their medications as prescribed. **Results:** 15 participants were randomized to 1 of 3 groups (UC=5, FI=3, SI=7). The majority were female (60%) and had a household income of \$50,000-\$100,000 (57%). Age ranged from 43 to 83 years (mean=64.4±10.6). Mean percent of days adherent was highest in the FI group (95%±6%), followed by the SI group (88%±20%) and UC group (77%±33%). Participant perceptions of the incentives, indicated on baseline survey, suggested that financial incentives were moderately effective and the social incentives (i.e., wanting their family or pharmacist to see they are adherent) were extremely effective. **Implications:** Medication adherence appears to be enhanced using either financial or social incentives compared to UC, although sample size was too small to test for statistical significance. Larger studies in a more diverse population are warranted, and in-depth focus groups may help to expound the role of social incentives.

**Lifestyle Medicine Elective Impacts Youth's Mental Health.** Lilia Z. Macias-Moriarity, *South University*, K.Brooke Rumker, Alexis McGlynn, Sylvia Wallis, *Savannah-Chatham County Public School System*, Tracey Meade, *South University*, Kathryn Klock-Powell, *South University*. **Objectives:** Provide student pharmacists an opportunity

to apply their knowledge of lifestyle medicine through a didactic and experiential component Determine whether facilitating yoga-like exercises and mindfulness activities decreased stress and anxiety in student pharmacists Determine whether participating in mindfulness activities and yoga-like exercises decreased stress and anxiety in youth. **Method:** Immersive Lifestyle elective provided students with an opportunity to increase and apply their knowledge of lifestyle medicine. Instructors and student pharmacists (n=7) facilitated Pure Edge® Pure Power curriculum for half-hour, twice a week, for 8 weeks to 3rd graders (n=34) and 5th graders (n=23). Beck Anxiety Inventory (BAI) and Patient Stress Questionnaire (PSQ) assessed student pharmacists while the Spence Children's Anxiety Scale (SCAS) and Self-Perception Profile for Children (SPPC) were used to measure outcomes in youth. **Results:** There were no differences in BAI and PSQ in student pharmacists before and after the elective. Third graders exhibited significant improvements in SPPC self-worth subscale (p=0.019) and SCAS total anxiety score (p=0.001) and subscales in separation anxiety (p=0.007), social phobia (p=0.02), obsessive compulsive (p=0.01), and panic agoraphobia (p=0.026). Fifth graders improved in all measures and statistically significant in SCAS separation subscale(p=0.029). **Implications:** Faculty conducted a focus group to improve course design focusing on integrating skills to decrease stress and anxiety in student pharmacists. Third grade participants demonstrated a significant increase in self-worth, which may indicate increases in learned coping skills for dealing with stressful and anxiety provoking situations. Findings support yoga-like exercises and mindfulness to promote wellness in elementary school youth.

**Longitudinal Assessment of Changes in Cultural Competence and Health Literacy Knowledge in Pharmacy Students.** Aleda M. Chen, *Cedarville University*, Stephanie M. Cailor, *Cedarville University*. **Objectives:** To evaluate changes in cultural competence (CC) and health literacy (HL) knowledge across a 4 year professional program, as these are important factors that enable pharmacists to be sensitive and attentive to their patient's needs. **Method:** Student CC and HL knowledge was assessed at the beginning of the P1 year (pre-integration of introductory CC and HL concepts), end of P1 fall (post-integration), and end of each P1-P4 year using the Inventory for Assessing the Process of Cultural Competence among Healthcare Professionals—Student Version© (IAPCC-SV©, Campinha-Bacote, 2007; 20 questions, 4-point Likert) and the Health Literacy Assessment (23 questions, 7-point Likert). Data were analyzed using frequencies, Wilcoxon signed-ranks tests, and Friedman's ANOVA to assess longitudinal changes. **Results:** Students (N=53) had significant improvements on 3 of 5 cultural constructs (awareness p=0.030, knowledge p<0.001, and skill p<0.001) from baseline to the end of P4 year, as well as 2 significant declines (awareness p=0.020 and desire p=0.008) from mid P1 to end of P4. Students' total IAPCC© score improved from baseline (p<0.001) and was sustained through the P4 year. Longitudinally, there were significant differences on 5 of the 6 HL Knowledge items, all of the 9 HL Understanding items, and 8 of the 9 HL Application items. **Implications:** Incorporating CC and HL concepts into the pharmacy curriculum causes sustained increases in student cultural knowledge and skill and HL perceptions, understanding, and application. Other changes can be sustained by increasing student experience and exposure to patients of different cultural and health literacy backgrounds.

**Longitudinal Assessment of Student Pharmacists' Perceptions of and Confidence in Research and Evidence-Based Practice.** Stephanie M. Cailor, *Cedarville University*, Aleda M. Chen, *Cedarville University*, Mary E. Kiersma, *Accreditation Council for Pharmacy*

**Education. Objectives:** To evaluate changes in pharmacy student perceptions of and confidence in research longitudinally. **Method:** Research skills are essential to comprehend and utilize evidence from literature to provide optimal patient care. Students' research perceptions and confidence were assessed at the beginning of the P1 year (pre-required research course), end of P1 fall (post-research course), and end of each P1-P4 year using an instrument with 9 Research Perceptions and 17 Confidence in Research Likert-type items, with additional P4 questions regarding their research course experience and longitudinal group research project. Data were analyzed using frequencies, Wilcoxon signed-ranks tests, and Friedman's ANOVA to assess longitudinal changes. **Results:** Comparison of baseline-P4 year and longitudinal perceptions (N=53) indicated greater agreement on all confidence and 3 research perceptions (related to the use of evidence-based practice) items ( $p < 0.05$ ). The higher agreement occurred between pre-research course to post-course and were sustained over the curriculum (no significant changes between post-course to end P4). P4 students also agreed that the research course was useful for APPEs and their career (4-point Likert-type; Mean  $\pm$  SD =  $3.13 \pm 0.548$  and  $3.16 \pm 0.673$ , respectively) and that their required research project improved their understanding of research and was a valuable experience (7-point Likert-type; Mean  $\pm$  SD =  $5.98 \pm 0.715$  and  $5.79 \pm 0.976$ , respectively). Over 20% of students presented their research at a state or national conference and 15.1% had a manuscript published or under review. **Implications:** Including a required research course and longitudinal research project increases student confidence in research skills which were sustained throughout the curriculum. Students valued the learning experience.

#### **MMI, PCAT and Pharmacy GPA Are Associated With Performance on Cumulative High-Stakes Examination in Senior Year.**

Seth D. Heldenbrand, *University of Arkansas for Medical Sciences*, Ashley Castleberry, *University of Arkansas for Medical Sciences*, Nalin Payakachat, *University of Arkansas for Medical Sciences*, Lindsey E. Dayer, *University of Arkansas for Medical Sciences*, Bradley C Martin, *University of Arkansas for Medical Sciences*, Angie Choi, *University of Arkansas for Medical Sciences*, Schwanda K. Flowers, *University of Arkansas for Medical Sciences*. **Objectives:** Determine admission and curriculum factors associated with performance on a high-stakes summative exam (SE2) administered in the senior year of the PharmD curriculum. **Method:** A pooled retrospective study was conducted using SE2 data from 2012-2014. The SE2 consists of two components, a 10-case objective structured clinical examination (OSCE), and the Pre-NAPLEX administered electronically by the National Association of Boards of Pharmacy. The SE2 total score was weighted where OSCE represented 80%, and the Pre-NAPLEX 20%. Early predictors of performance were explored including admission variables (pre-pharmacy GPA, PCAT, multiple-mini interview (MMI) score, demographics, etc.) and pharmacy GPA (P1-P3). Pearson product-moment correlations and ordinary least-square regression models were performed to identify predictors of SE2 performance. **Results:** Students ( $n=343$ ) had a mean SE2 score of 83.15% ( $\pm 6.32$ ). Their mean pre-pharmacy GPA, PCAT, MMI, and age were 3.58, 73.15, 5.5, 22.6 years, respectively, and their mean pharmacy GPA was 3.15. Variables that were positively associated with higher SE2 scores in the multivariate regression were MMI score ( $\beta=0.879$ ;  $p=0.037$ ), PCAT ( $\beta=0.047$ ;  $p=0.048$ ), and pharmacy GPA ( $\beta=6.420$ ;  $p < 0.001$ ). **Implications:** MMI scores have previously been shown to predict didactic performance and overall Advanced Pharmacy Practice Experience scores in the PharmD curriculum. This study presents a positive association with MMI scores, PCAT composite score, and pharmacy GPA and overall performance on SE2.

Since MMI and PCAT are early indicators of SE2 performance, these factors should further influence admission decisions and assist in the identification of at risk students of poor performance on SE2.

#### **Medication Reconciliation and Transitions of Care: Knowledge, Attitudes, and Perceptions of Fourth-Year Pharmacy Students.**

Lindsey Hohmann, *Auburn University*, Jan Kavookjian, *Auburn University*, Erika L. Kleppinger, *Auburn University*, Amber M. Hutchison, *Auburn University*. **Objectives:** Medication reconciliation (med rec) and transitions of care (TOC) are areas of emerging pharmacist involvement. However, pharmacists report low perceived capability in med rec or TOC, and pharmacy students may not be adequately exposed to these services. Accordingly, the purpose of this study is to explore fourth-year pharmacy students' (P4s) knowledge, attitudes, and perceptions regarding med rec and TOC services before experiential rotations. **Method:** In Summer 2016 prior to experiential rotations, P4s participating in a longitudinal study were recruited in-person and via email to participate in an online 10-item cross-sectional survey. Knowledge was assessed using multiple choice questions and 7-point Likert-type scales. Attitudes and perceptions were measured via 7-point Likert-type scales. Descriptive statistics were applied. **Results:** Out of 117 eligible students, 57 complete responses were obtained (response rate = 48.72%). Over 71% were female, 88.2% Caucasian, and mean age was 25 years. Students most often rated themselves as "moderately" knowledgeable about med rec (36.8%) and TOC (43.8%), with classes and work experience the most common knowledge sources. Less than 32% believed that other healthcare providers were "very" likely to accept pharmacists performing med rec or TOC. Although 43-53% believed that it was "very" important for pharmacists to perform these services, less than 38% were "very" confident in their abilities to do so. **Implications:** To increase future pharmacists' knowledge and confidence, these emerging advanced practice areas should be included in curricular and experiential content. Future studies will compare knowledge and attitudes before and after experiential rotations.

#### **Outcomes of an Academic and Administrative Advanced Pharmacy Practice Experience.**

Melissa S. Medina, *The University of Oklahoma*, JoLaine R. Draugalis, *The University of Oklahoma*, Marcus T. Autry, *The University of Oklahoma*, Mary Shreffler, *The University of Oklahoma*, Sarah Hausner, *The University of Oklahoma*, Trisha M. Lepa, *The University of Oklahoma*, Katherine C. Newman, *OU Health Sciences Center*, Matthew Stailey, Gwenn Rosendale, *The University of Oklahoma*. **Objectives:** Academic and administrative (AAA) APPEs are offered to increase interest in and understanding of academic careers and can be used to develop pharmacy preceptor skills. Study objectives were: 1) evaluate students' perceptions of an AAA-APPE and whether it impacted participants' future career plans; 2) evaluate participants' longitudinal retention of AAA-APPE teaching knowledge; and 3) determine if participants became active preceptors after graduation. **Method:** Seventeen graduates of the University of Oklahoma College of Pharmacy who completed the AAA-APPE from 2009 to 2016 were invited to participate in the study. Participants completed a 25-item Likert-type survey with 5 categories ranging from strongly disagree to strongly agree. The survey assessed their experience in the AAA-APPE and their post-graduate pursuits, along with a nine item demographic survey. In addition, participants completed a 20-item multiple-choice test assessing knowledge of content taught during the 5 modules of the rotation. **Results:** The survey and test response rate was 94.1% and 81.3% entered postgraduate training. Respondents agreed (81%) that the AAA-APPE impacted their career path and helped them become an effective preceptor

(100%). Participants retained the AAA-APPE knowledge, with the highest score on the pharmacy academia module (91%). 71% of AAA-APPE participants became preceptors. **Implications:** The majority of AAA-APPE participants pursued a career in academia upon post-graduate training and a majority became preceptors. These findings suggest that the AAA-APPE can prepare students to serve as future educators in a variety of settings. Therefore, the AAA-APPE may be useful for training future preceptors.

**Participation in a Co-Curricular Program Designed to Address CAPE Outcomes Domain 4.** Graciela M. Armayor, *Nova Southeastern University*, Rochelle Nappi, *Nova Southeastern University*, Robert McGory, *Nova Southeastern University*. **Objectives:** To evaluate student participation in a co-curricular program designed to address CAPE Outcomes-2013 Domain 4. **Method:** A Professional Development Checklist (PDC) was created using CAPE Outcomes subdomains of self-awareness, leadership, innovation/entrepreneurship, professionalism in addition to university stewardship to structure learning experiences available to students in the co-curricular program. Specific activities were assigned to each PDC category to provide students a guide for selecting experiences. P1 students from all campus were required to complete 6 co-curricular experiences; two required in Professionalism category, one in University Stewardship and three selected from any category. Participation in co-curricular activities was assessed using data collected from the PDC documentation form submitted at the end of 2016 fall semester. Participation rate was determined by counting the number of completed experiences within categories. **Results:** 191 students (110-Ft. Lauderdale, 28-Palm Beach, 53-San Juan) submitted completed forms. Collectively students completed 1147 co-curricular experiences, a mean of 6 experiences/student in 4 of 5 PDC categories. One hundred twelve students (59%) completed 6 activities, 36 (19%) completed more and 43 (22%) completed less. Forty-three percent of all experiences completed were in the Professionalism category followed by Self-awareness (20%), University Stewardship (19%), Leadership (15%), and Innovation/entrepreneurship (3%) categories. Attending a college sponsored event (99%), leadership training (85%), or attending a self-improvement seminar/event (64%) were the most frequently chosen elective experiences. **Implications:** Students appear to select easily achievable co-curricular activities. Encouraging new activities is enhanced by a PDC, but more stringent limitations are necessary to attract students to unfamiliar experiences.

**Patient Satisfaction With Care Among Low-Income African American Women.** Olihe N. Okoro, *University of Minnesota*, Njoki Kamau, *University of Minnesota*. **Objectives:** Health disparities continue to disproportionately affect women of color and persons of low socioeconomic status. The purpose of the study was to explore the perceived quality of care received by persons at the intersection of three social determinants of health - race/ethnicity, gender and class. The main objective of the study was to assess patient satisfaction with care among low-income African American (AA) women in the Twin Ports Area of Minnesota. **Method:** A convenience sample of 95 low-income African American women was surveyed using the Short-form Patient Satisfaction Questionnaire (PSQ-18). Response categories were on a scale of 1 to 5 (maximum satisfaction). Descriptive statistics were used to aggregate and summarize scores for each of the seven scales assessed. **Results:** Mean scores for the seven different scales assessing patient satisfaction ranged from 2.99 ( $\pm 0.91$ ) for the 'Accessibility and Convenience' scale to 3.35 ( $\pm 1.05$ ) for the 'Financial Aspects' scale. The mean scores of respondents for other scales assessed were as follows: 'Technical Quality' (3.25 $\pm 0.85$ ), 'Interpersonal

Manner' (3.31 $\pm 1.07$ ), 'Communication' (3.29 $\pm 0.98$ ), 'Time spent with Doctor' (3.01 $\pm 1.03$ ), and 'General Satisfaction' (3.02 $\pm 1.03$ ). **Implications:** Findings from the current study suggests that this vulnerable population perceive the healthcare they are receiving as generally less than satisfactory, with areas of least satisfaction being those associated with access to care and the provider-patient interaction. How healthcare providers engage with this population and the length of time allotted to clinic visits are critical to their satisfaction with care and has consequences for health outcomes. Current efforts around cultural competency training of healthcare providers should be strongly encouraged.

**Pharmacy Education: A Prescription for Cultural Competence.** Caitlin Gibson, *University of North Texas System*, Annesha White, *University of North Texas System*. **Objectives:** The Accreditation Council for Pharmacy Education requires that pharmacy curricula address cultural competency and health care disparities. The objectives of this study were to examine student perceptions of their own cultural competence, the relationship between demographics and perceptions of cultural competence, learning outcomes from a cultural competency panel. **Method:** Third year pharmacy students who attended an in-class cultural competency panel completed pre- and post- surveys measuring student perceptions of cultural competence and helpfulness of the panel. The survey included Likert scale questions and a free-text section for reflections. Descriptive statistics, chi-squared tests, and t-tests, and qualitative analysis were conducted. **Results:** Sixty students completed the survey (86%): 63% were  $\geq 26$  years old, 63% were Asian, and 25% were Caucasian. Ninety-eight percent of students agreed or strongly agreed that a cultural competency panel is a worthwhile experience, and 95% felt the panel would help them change behaviors. Mean Likert scale scores improved between the pre- and post- surveys for both questions ( $p < 0.05$ ). Ethnicity significantly impacted response to these questions ( $p < 0.05$ ). In reflections, students reported learning about effective communication (63%), new resources for diverse patient populations (27%), and the importance of patience and empathy (22%). **Implications:** This study demonstrated that students find value in a cultural competency panel, and ethnicity impacted student experiences with the panel. The survey also highlighted key cultural competency takeaways that students had not yet learned via more traditional course delivery. To promote interprofessional cultural competency, the panel will be expanded to include physician assistant students next year.

**Pharmacy Student Opinions of Suicide Prevention Training.** Ekim Ekinci, *Houston Methodist Hospital*, Karen Blumenschein, *University of Kentucky*. **Objectives:** Suicide is the tenth most common cause of death in the United States; for each case of suicide mortality, there are 25 cases of suicide-related morbidity. Suicidal ideation is a potential side effect for several prescription medications. Given the role medications may play in suicide-related morbidity and mortality, the relative absence of suicide prevention training in pharmacy schools is surprising. The objective of this study was to assess first-year pharmacy student opinions related to a suicide prevention training module. **Method:** Student opinions pertaining to their participation in a suicide prevention module were evaluated using an anonymous online survey four months after module completion. Survey was comprised of 22 items assessing demographic information, students' opinions on pharmacists' role in unintentional injury and suicide prevention, and the perceived utility of the training for their professional and personal lives. The institution's IRB approved the study. **Results:** Sixty-seven students out of 139 responded (48.2%). Overall, 86.6% of respondents stated that pharmacists should have a role in suicide prevention and

88% believed that suicide prevention training should be provided during pharmacy school. When asked if they believed they would use suicide prevention skills in their future professional careers, 61% responded affirmatively, 30% were unsure, with 9% responding that they would not use these skills in the future. **Implications:** First-year pharmacy students endorsed the utility of having suicide prevention training by stating that these skills will be useful in their future careers. Pharmacy schools are encouraged to evaluate their current strategies for providing suicide prevention training.

#### **Pharmacy Student Use of Technology during the Didactic Years.**

Nancy Wilson, *The University of Montana*, Jean T. Carter, *The University of Montana*. **Objectives:** Describe pharmacy students' use of and level of comfort with technology as learning and patient care tools. **Method:** Students in the first three years (P1-P3) of the professional pharmacy program completed a 12-item questionnaire between Dec 7-9, 2016. The IRB-approved survey asked about students' use of technology and apps as well as their perspectives on comfort, usefulness, training, and frustration with technology. **Results:** Response rates were 82% (P1), 68% (P2), and 89%(P3). Smartphones were the most commonly used technology (93% (P1), 96% (P2), and 100% (P3). Over 90% of students used laptops. Tablets were used by 48% (P1), 63% (P2), and 38% (P3). Clinical Pharmacology was the most frequently used app across all three years with 93% (P1), 100% (P2) and 96% (P3). The BMI calculator use went from 19% (P1) to 59% (P3). The average (SD) total number of apps used increased from 3.15 (1.857) in P1 year to 4.45 (2.373) in P3 year ( $p=0.00182$ ). Over 85% of students agreed they were comfortable using technology to learn, thought using technology was an important pharmacy skill, and technology tools were needed to be successful. Students indicated instruction about which technology resources to use in specific practice settings or how to find those resources were inadequate. **Implications:** Although pharmacy students are experienced and comfortable with using technology, including apps, they would like more instruction during pharmacy school for appropriate use of technology in specific practice settings and finding technology resources for patient care.

#### **Pharmacy Students' Dispensing Behaviors in Practice-Based Dilemmas.**

KariLynn Dowling, *East Tennessee State University*, Nicholas E. Hagemeyer, *East Tennessee State University*, Cortney M. Mospan, *Wingate University*. **Objectives:** To examine the extent to which pharmacy students' attitudes, subjective norm beliefs, and perceived behavioral control beliefs explain gray dispensing decisions, using the theory of planned behavior (TPB) as a framework. **Method:** Third professional year pharmacy students ( $n=159$ ) from two academic cohorts were provided three written case scenarios: (1) a dentist prescribing outside of his scope of practice; (2) a physician prescribing for a family member; and (3) a patient who was out of refills on insulin. A brief questionnaire assessed TPB constructs, whether or not the student would dispense the medication, and the number of times the student would dispense in 10 similar situations. Composite scores were calculated for TPB constructs after analyzing internal consistency reliability. Linear regression techniques were used to analyze the influence of the constructs on mean intent to dispense in similar scenarios. **Results:** The percent of students who indicated they would dispense in each scenario was 68% in scenario 1, 74% in scenario 2, and 81% in scenario 3. For all case scenarios, mean intent to dispense in similar scenarios was explained by attitude scores ( $p\leq 0.006$ ). For the insulin refill and family prescribing cases, mean intent to dispense was also explained by subjective norm beliefs ( $p<0.001$ ). **Implications:** Student attitudes consistently predicted intention to dispense across the

gray scenarios. These findings can be used to develop and target upstream TPB construct interventions in pharmacy education that influence students' downstream dispensing decisions. Additional research is warranted to determine if TPB constructs similarly explain the dispensing behaviors of practicing pharmacists.

#### **Pharmacy Students' Performance and Perception Within a Flipped Classroom in a Research Methodology Section.**

Surachat Ngorsuraches, *South Dakota State University*, Teresa M. Seefeldt, *South Dakota State University*, Brittny A. Meyer, *South Dakota State University*. **Objectives:** To examine the impact of a flipped classroom design on pharmacy students' performance and perception within a research methodology section. **Method:** Two 50-minute classes covering data analysis topic within the research methodology section of a course were flipped. Second year pharmacy students viewed an online video lecture prior to the first class. Then, students worked on active-learning exercises and discussed their answers with the instructor during classes. Two graded quizzes worth 5 points each were used to assess students' performance at the beginning of the first class and the end of the second class. Students' perception of the flipped classroom was examined by using a self-administered survey containing 15 questions using a 5-point Likert scale at the end of the last class. **Results:** A total of 77 students attended both classes and took the quizzes. The mean quiz score at the end of the classes significantly increased from the mean quiz score at the beginning of the classes ( $4.17\pm 0.98$  vs  $3.89\pm 0.94$ , respectively,  $p<0.05$ ). A total of 66 students responded to the perception survey. Overall, they agreed with using the flipped classroom design for the data analysis topic ( $3.81\pm 2.73$ ). The students agreed that the in-class exercises were helpful and rated them with the highest score ( $4.58\pm 0.55$ ). Their perception of the video length was poor ( $2.19\pm 0.99$ ). **Implications:** A flipped classroom design can improve pharmacy students' performance and positively impact their perception of learning about data analysis within a research methodology section. Appropriate length of online video lecture needs to be determined.

#### **Postdoctoral Academic Fellowship Programs: Training for Careers in Pharmacy Academia.**

Jeeseon Kim, *Touro College of Pharmacy-New York*, Erica Tolle, *University of Cincinnati*, Roopali Sharma, *Touro College of Pharmacy-New York*, Neil J. MacKinnon, *University of Cincinnati*. **Objectives:** (1) To describe currently active postdoctoral academic fellowship programs intended to prepare new practitioners for careers in academia and (2) to address issues related to future development and accreditation of such programs. **Method:** A list of academic fellowship programs was compiled from the American College of Clinical Pharmacy's directory of residencies, fellowships, and graduate programs, the American Society of Health System Pharmacy's 2016 Pharmacy Placement System registry, a survey distributed to all pharmacy deans, and a web search. Final analysis included programs that met author-developed criteria. Supplemental information will be obtained later via telephonic interviews. In addition to individual program analysis, a literature search was performed to evaluate the need for postgraduate training for careers in pharmacy education and to offer guidance for developing future academic fellowships. **Results:** Five programs met the pre-specified criteria for study inclusion. All programs were relatively new with 1-2 years of duration, 0-2 graduates, and 1-2 available positions per year. Although fellowship requirements and opportunities varied, all programs heavily focused on teaching and included practice, scholarship and service to the college. Finally, they all stated a similar objective to prepare fellows for a career in academia. **Implications:** All 5 of the described programs exist to prepare new practitioners to succeed in all

aspects of academic life, including teaching, practice, scholarship and service. Only a small number of programs exist; therefore, development of additional academic fellowship programs in pharmacy would provide new practitioners with an opportunity to acquire skills for an academic career in pharmacy.

**Prediction of Pharmacy Business Plan Innovativeness Based on Creative Personality and Adaption Innovation of Second-Year Students.** David A. Gettman, *D'Youville College*. **Objectives:** The primary objective was to determine whether creative personality and adaption innovation of second-year pharmacy students could help predict innovativeness of pharmacy students putting together business plans. The secondary objective was to determine if age or gender were also associated with these relationships. **Method:** This study utilized second-year pharmacy students taking a pharmacy management course. Volunteers filled out an anonymous online Qualtrics survey. The survey consisted of (1) a 12-item innovativeness scale (Stock and Zacharias, 2013), (2) a 30-item creative personality scale (Gough, 1979), (3) a 9-item adaption innovation in workplace measure (Xu and Tuttle, 2012), and (4) questions regarding students' age and gender. Descriptive statistics, correlations, and regression analyses were conducted using SPSS Version 23. **Results:** 28 males and 44 females responded (97% response rate). 53 students were less than 25 years of age. The means for the 2 subscales for innovativeness of generated ideas subscales were 23.2 for newness and 41.0 for meaningfulness. The mean for creative personality was 2.8. The means for the 3 subscales of adaption innovation were 8.4 for efficiency, 9.3 for governance, and 11.1 for originality. In a model to predict innovativeness of generated ideas, an R-Sq of .311 was found when creative personality and 2 subscales of adaption innovation (governance and originality) were included. **Implications:** Assessing student achievement of the CAPE Domain 4 is currently a major focus of pharmacy education. This study will help students better engage in innovative activities by better understanding their creative thinking to accomplish successful entrepreneurship in general and business planning in particular.

**Preferences for Cultural Competence Teaching Strategies in First Year Pharmacy Students.** Gladys Ekong, *Auburn University*. **Objectives:** Cultural competence (CC) curricular content is a pharmacy education accreditation requirement meant to help reduce health disparities that may occur from miscommunication or misunderstandings. The CC module in a patient-centered skills course was designed to expose students to how diverse cultural backgrounds influence patients' health literacy and treatment choices. This study aims to answer the research question: What teaching strategies are most preferred by first-year pharmacy students for increasing awareness about the impact of cultural differences among patients? **Method:** The IRB approved cross-sectional study was conducted among consenting first year pharmacy students (N= 134/145) in Fall 2016. Students' predisposition to cultural sensitivity was assessed before exposure to the CC content using the Intercultural Sensitivity Survey (ISS) (24 Likert-type items, higher score indicates higher cultural sensitivity). Multiple CC teaching/self-awareness strategies were implemented and assessed, including interactive lectures, flipped classroom Worlds Apart videos/discussions with Individual Retention Assessment Test (IRAT), self-awareness survey (Self-Assessment of Perceived Level of Cultural Competence), discussion panel interviewing healthcare providers from other countries. A post assessment of student ranking of and comments about preferred teaching methods was implemented after the CC content. Descriptive statistics were applied (frequencies, means). **Results:** Mean ISS was 94.9 (sd = 10.2; range 58 -118). Student rankings of teaching strategies that most effectively increased cultural sensitivity

were (highest to lowest); discussion panel (54%), video examples (24%), self-awareness survey (12%), lectures (5%), IRAT (5%). **Implications:** Assessing students' preferences for teaching/training methods could be useful for reinforcing awareness-raising about communication needs with culturally diverse patients.

**Prevalence and Predictors in Receiving Weight-Related Counseling Among Older Adults: A MEPS Study.** Lori Ward, *The University of Mississippi*, Manasi Suryavanshi, *The University of Mississippi*, Yi Yang, *The University of Mississippi*. **Objectives:** A growing percentage of older adults in the US are obese. In an effort to help address the obesity epidemic, the National Heart, Lung, and Blood Institute recommends counseling for effective weight management. The objectives of this study were to: (1) describe the prevalence of receiving weight-related counseling, and (2) assess sociodemographic and clinical factors associated with receiving weight-related counseling among obese older adults. **Method:** A retrospective observational study was conducted among obese older adults identified in the 2013 Medical Expenditure Panel Survey. For inclusion in the study, individuals had to be 65 years of age or older and have a BMI  $\geq 30$  Kg/m<sup>2</sup>. Multivariable logistic regression was used to assess predictors of receiving weight-related counseling among obese older adults. **Results:** Among the 1,111 obese older adults who met the inclusion criteria, a higher proportion were White (77%), high school graduates (59%) and had private insurance (53%). There were 874 (79%) obese older adults who received weight-related counseling. After controlling for sociodemographic and clinical factors, obese older adults were less likely to receive counseling if they were uninsured (OR: 0.145;  $p=0.0419$ ) or did not have other obesity-related health conditions (OR: 0.373;  $p<.0001$ ). As age increased (by one year), obese older adults were less likely to receive weight-related counseling (OR: 0.945;  $p=0.0040$ ). **Implications:** Among obese older adults, age, having insurance, and having obesity-related conditions were significant predictors of receiving counseling. Providers should ensure that all patients affected by obesity should receive weight-related counseling to aid in improving their health outcomes.

**Publication Rates of Social and Administrative Pharmacy Faculty in Non-Research Intensive Colleges of Pharmacy.** Trena Weathers, *Roseman University of Health Sciences*, Elizabeth J. Unni, *Roseman University of Health Sciences*. **Objectives:** To assess the level of publication rates from 2011 through 2015 by Social and Administrative Sciences (SAS) faculty at non-research intensive colleges of pharmacy. **Method:** The Web of Science database was searched using faculty names identified from the AACP faculty and professional staff roster. Publication rates of SAS faculty were calculated and compared using several demographic subcategories such as public/private school, part of an academic health center, schools with PhD program, funding status, etc. **Results:** The 208 SAS faculty from 59 colleges contributed to a total of 478 publications with a mean of 95.6 publications per year and 1.62 publications per institution per year. The number of publications increased 45% over the five years from 67 publications in 2011 to 122 in 2015. The average number of publications was 0.92 per year per SAS faculty compared to 0.82 publications per year per faculty from other basic pharmaceutical sciences divisions. The most commonly published research was research articles in the area of Scholarship of Teaching and Learning. The significant predictors of publications were being part of an academic health center, having a PhD program, and higher percent of faculty who are SAS faculty. **Implications:** Despite being affiliated with institutions with missions less targeted on research, this study showed SAS faculty members at non-research intensive institutions consistently contribute

to published literature. Further studies are needed to examine reasons for the lack of publishing by almost half of the SAS faculty and ways to increase research and publication in the field of SAS.

**Residency, Fellowship, and Graduate School Value Beliefs Among Student Pharmacists.** Andrew Tarasidis, *East Tennessee State University*, KariLynn Dowling, *East Tennessee State University*, Anh Dinh, *East Tennessee State University*, Pooja Subedi, *East Tennessee State University College of Public Health*, Daniel J. Ventricelli, *University of the Sciences*, Nicholas E. Hagemeyer, *East Tennessee State University*. **Objectives:** To compare pharmacy students' value beliefs across residency training, fellowship training, and graduate education with research and non-research emphases using expectancy-value theory as a framework. **Method:** First through fourth professional year (P1-P4) students (N=263) completed the 26-item Postgraduate Training Value Instrument (PTVI) for four postgraduate training paths. Items were responded to using a 5-point Likert scale. Intrinsic, attainment, utility, financial value and perceived cost scores were calculated for each training path. Using SAS 9.0, ANOVA procedures were employed to test differences between mean value construct scores across training paths. **Results:** An 84% response rate was obtained. Value construct scores ranged from 2.02 for financial value of fellowship training to 3.36 for intrinsic value of residency training. Positive value scores (i.e., scores that theoretically support task choice) were noted for two (residency intrinsic value and residency utility value) of the 20 evaluated value constructs. Students reported statistically significantly higher intrinsic, attainment, utility, and financial value scores for residency training as compared to other paths ( $p < 0.0001$ ). Perceived cost did not differ across training path ( $p = 0.48$ ). **Implications:** To our knowledge, this is the first study to theoretically quantify students' value beliefs across commonly pursued postgraduate training paths. Our results indicate an overall lack of intrinsic, attainment, utility, and financial value for most paths and high perceived cost across all paths. The PTVI could be used to target interventions across curricula that seek to promote the value of various postgraduate training paths. Research is warranted to explore students' value beliefs longitudinally.

**Role of Prior Math Credit Hours in Student Performance at the USF College of Pharmacy.** Kevin B. Sneed, *University of South Florida*, Natasha Baloch, *University of South Florida*, Nazach Rodriguez-Snapp, *University of South Florida*. **Objectives:** The analysis investigates the relationship between student progression and pre admission factors affecting student's performance in a Doctor of Pharmacy Program. The research specifically examines the relationship between prior math credit hours (not previously analyzed to our knowledge) and academic interruption analyzing two groups of students; students with academic interruption vs students with no academic interruption. **Method:** The data used in this analysis comes from a 5 year longitudinal student database from 2010 to 2015. A total of 396 students were included in the analysis. Descriptive statistics and Pearson Product-moment correlation coefficient analyses were conducted to explore relationships between prior math credit hours, other pre admission variables and academic progression. Independent t-tests were conducted between prior math credit hours and other pre admission variables for the two groups of students. **Results:** Results show statistically significant ( $p < 0.01$ ) differences in prior math credit hours between students with academic interruption vs those with no interruptions. These are also negatively correlated with student performance in other pre admission variables including PCAT scores, prior university GPA and PY1 GPA. **Implications:** The findings suggest that students with academic interruptions had

on average higher number of math credit hours suggesting a higher number of repeated math classes. A further multivariate analysis may be useful to reconfirm and estimate the impact of prior math credit hours on student progression. Pharmacy programs can develop math boot camps prior to starting the program and provide additional supports to students upon matriculation. Early identification and support may lead to less academic interruption(s).

**Sleep Habits and Quality Among Pharmacy Faculty Members.** Jennifer N. Clements, *Presbyterian College*. **Objectives:** This study was designed to determine an association between sleep habits and quality among pharmacy faculty members from schools or colleges of pharmacy in the United States. **Method:** A survey was administered during August 2016 with voluntary participation. The survey contained 20 questions regarding demographics and the Pittsburgh Sleep Quality Index. Wilcoxon sum rank test and Kruskal Wallis test were used for two groups or more for global scores; chi-square test analyzed proportional differences of good versus poor sleep by characteristics; and a multivariate logistic regression model calculated factors associated with poor sleepers. **Results:** Of 7043 faculty members, 1213 (17.82%) completed the survey. A global score was calculated as 6.08, with 66.7% of faculty members categorized as poor sleepers. There was a significant difference in the global score between married and unmarried groups ( $p < 0.001$ ) and an association between job title and global scores ( $p < 0.001$ ). The proportion of poor sleepers in unmarried group was significantly higher than the married group (76.7% vs. 63.5%,  $p < 0.001$ ). Full-time professors were noted to have a 50% reduction in being a poor sleeper as the proportions of poor sleepers were significantly difference among the respondents with different job titles ( $p = 0.009$ ). **Implications:** This survey concluded a majority of pharmacy faculty members could be categorized as poor sleepers, particularly among those unmarried. Job title of full-time professor may be associated with a reduction in the classification of poor sleeper. Additional studies should be conducted to assess sleep habits and quality during an academic year.

**Student Empathy for Patients with Chronic Diseases.** Juanita A. Draime, *Cedarville University*, Aleda M. Chen, *Cedarville University*, Mary E. Kiersma, *Accreditation Council for Pharmacy Education*. **Objectives:** The Accreditation Council for Pharmacy Education (ACPE) standards emphasize the importance of developing professional attitudes and behaviors, particularly when dealing with patients who have chronic disease. The objective was to determine if students who enrolled in an empathy-related elective had greater increases in empathy post-class. **Method:** Two cohorts of third-year pharmacy students in their final didactic semester (N=93) completed the validated Kiersma-Chen Empathy Scale (15 items, 7-point Likert-scale, range 15-105) pre-post semester. A subset of students (N=26) completed a Health Behaviors and Beliefs elective designed to promote student empathy and understanding toward patients with chronic disease. Paired t-tests assessed within-group changes; unpaired t-tests compared those who did and did not take the elective. **Results:** There were no significant differences in baseline empathy between groups, pre-post empathy overall, and pre-post empathy for those who did not take the elective ( $p > 0.05$ ). Students who took the elective had a non-significant increase in empathy post-semester (mean  $\pm$  SD: 84.96  $\pm$  10.32 vs. 85.40  $\pm$  9.38,  $p = 0.689$ ); they also had non-significant higher post-semester total scores than those who did not take the elective (mean  $\pm$  SD: 85.40  $\pm$  9.38 vs. 82.62  $\pm$  7.83,  $p = 0.156$ ). Three individual items were significantly higher in the elective cohort at the post-assessment ( $p < 0.05$ ). **Implications:** A course designed to improve student empathy did not significantly improve empathy;



however, students may have higher empathy due to the mission-focus of the institution. In addition, the timing of the elective may be too late, since students in their third-year may already have solidified their patient perspectives. Future research should examine the appropriate timing.

**Student Experience With a Co-Curricular Program Designed to Enhance Personal and Professional Growth.** Rochelle Nappi, *Nova Southeastern University*, Graciela M. Armayor, *Nova Southeastern University*, Robert McGory, *Nova Southeastern University*. **Objectives:** To assess student satisfaction of a structured co-curricular program designed to increase guidance in selecting experiences that foster personal and professional development. **Method:** A formal co-curricular program was developed that required students to complete a minimum of 7 co-curricular activities divided between 5 specific areas of professional growth. First-year pharmacy students completed an anonymous 17-item on-line questionnaire at the end of the first semester. A five-point Likert scale measured: the impact on personal/professional growth, the value of the experiences, the development of problem solving skills, the ability to work as a team member, interaction with other healthcare professionals and cultural awareness. Barriers to completing co-curricular experiences were also addressed. **Results:** One hundred ninety-nine students, 67.3% female, 31.7% male and 1% gender neutral completed the questionnaire (74% response rate). Eighty one percent of students found the experiences helped them grow as a person/professional; 73% found the co-curricular experiences to be of value; 60% reported that their ability to problem solve increased and 79% stated that their ability to work as part of a team improved. Eighty seven percent indicated co-curricular experiences allowed interaction with other healthcare professionals and 75% reported improved knowledge of individuals from other races/cultures. Academic obligations were the most common barrier to completing co-curricular experiences. Overall, 73% of students would complete co-curricular activities if not required. **Implications:** A co-curricular program structured to provide experiences focusing on personal/professional growth is valued by students and promotes growth in these areas.

**Student Pharmacist Perceptions of Managerial Roles and Responsibilities.** Cortney M. Mospan, *Wingate University*. **Objectives:** To assess student pharmacists' initial perceptions regarding pharmacy management roles and responsibilities prior to a pharmacy management course. **Method:** A survey assessed third-year student pharmacists' perceptions and interest in pharmacy management before a pharmacy management course. Survey responses were summarized using descriptive statistics and Wilcoxon Rank-Sum tests were used to compare responses based on previous paid pharmacy experience and managerial roles in those positions. **Results:** Ninety-nine students (98% response rate) completed the survey. Only 34% of students had any managerial responsibility within work experiences, but 93% had paid pharmacy experience. Sixty-seven percent felt that pharmacists must perform managerial functions, even if not a manager; one-third strongly agreed and one-half of agreed that all pharmacists must act as managers. Ninety percent strongly agreed or agreed that managerial education was as important as clinical education in pharmacy school. Nearly two-thirds indicated desiring to have a managerial role in their pharmacy career, with the greatest percentage (40.4%) desiring to hold a position early in their careers (1-5 years). Students' work experience and managerial experience did not have significance on responses excluding their belief that all pharmacists must act as managers ( $p=0.045$ ). **Implications:** Overall, attitudes reflected a positive view of managerial skills and roles of pharmacists before a pharmacy

management course. An overwhelming majority of student pharmacists had paid pharmacy experience, which may have impacted their favorable view of management functions and awareness of the prevalence of management functions among pharmacists. These results suggest further investigation to understand student pharmacists' perceptions of management within the profession of pharmacy.

**Student Satisfaction With a Leadership Degree Option Program.** Philip E. Looper, *The University of Oklahoma*, David L. George, *The University of Oklahoma*, Jane E. Wilson, *The University of Oklahoma*, Michael J. Smith, *The University of Oklahoma*. **Objectives:** Describe pharmacy student satisfaction with leadership development after completing a leadership degree option program (LDO). **Method:** Four cohorts of pharmacy students [(n=7, class of 2013), (n=14, class of 2014), (n=17, class of 2015), (n=19, class of 2016) who completed the 36 month LDO were asked to complete a satisfaction survey. The LDO consists of multiple leadership elective courses that offers content focused on individual leadership assessments, team-related activities, organizational culture, harmony, and networking. All LDO graduates were emailed an online link to the 20-item, electronic, self-report survey. A 4-point Likert-type scale of agreement (1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree) was used. A modified Dillman method for survey administration was employed. Participants had two weeks to complete the survey with reminder emails delivered on the 7th and 11th days to improve response rate. Data from cohorts were collated and descriptive analyses conducted to report student satisfaction. **Results:** A total of 48 respondents completed the survey, a response rate of 84%. The mean point score for survey items ranged from 3.77 to 4.0, exhibiting respondent agreement with satisfaction of the LDO program. Survey data also indicated all respondents agreed that the LDO prepared them to lead others, contributed to professional development, inspired them to develop leadership skills in others, and is something they would recommend to other students. **Implications:** Participants of the LDO agreed that the program met leadership development objectives and reported positive comments about the Program.

**The Disparity of State Continuing Professional Education Requirements – A Call for National Uniformity.** David M. Baker, *Western New England University*, Kelsey Leite, *Western New England University*, Faaieza Khan, *State University of New York at Old Westbury*. **Objectives:** Study objective was to determine the diversity of jurisdictional pharmacist continuing education (C.E.) requirements in the hope of creating a uniform list of requirements that could be proposed as national standards. **Method:** Pharmacist C.E. requirements were surveyed to determine the jurisdictional details. The following was assessed: annual C.E. hour requirement; renewal schedule; any special education requirements, e.g., law C.E. or live C.E.; other unique C.E. approval requirements; and whether excess C.E. hours earned can be carried over to a subsequent period. **Results:** The pharmacy C.E. requirements of all fifty states, Puerto Rico, Guam, and Washington, D.C. were surveyed. Annual required C.E. hours ranged from 7.5 to 20, and the most common annual requirement, found in forty-three jurisdictions, was 15 hours. Thirty-three jurisdictions use a biennial C.E. period, seventeen an annual period, and three have a triennial period, with varying calendar start and end dates. As for specialty requirements: ten states require 1-2 hours of law C.E.; twenty states require 2-7.5 hours of live C.E.; and there is a diverse list of requirements covering areas like patient safety, infectious diseases, medication errors, immunizations, and therapy management. Finally, twenty-two states do not allow excess C.E. credits to be carried over into a subsequent year, while five allow it in varying degrees.

**Implications:** The lack of any national standards for pharmacist C.E. requirements creates difficulties for pharmacists licensed in multiple jurisdictions to comply with the disparate C.E. requirements. Review of the current state requirements could assist national entities to provide consolidated uniform standards for pharmacist C.E.

**The Impact of an Interactive Oncology Activity on Students' Confidence and Perceptions of Oncology Pharmacy.** Elizabeth C. Ledbetter, *Cedarville University*, Aleda M. Chen, *Cedarville University*, Juanita A. Draime, *Cedarville University*, Chelsea Manion, *Cedarville University*. **Objectives:** With exponential growth in new oncology therapies and the expansion of oral therapies, all pharmacists need to be prepared to provide care to oncology patients. The objective of this study was to assess the impact of an interactive oncology activity on students' (1) confidence in dealing with oncology-related issues and (2) perceptions of pharmacists' involvement in cancer care. **Method:** In the fifth week of a five-week oncology module, third-year students participated in an interactive activity that highlighted oncology scenarios in the four different practice settings (managed care, community pharmacy, hospital not dispensing chemotherapy, hospital dispensing chemotherapy), allowing them to apply skills in providing patient care. Students completed pre-post activity assessments of their perceptions and confidence. After establishing face and content validity through expert and student review, the final instrument contained 17 items (7-point Likert-type, 9 confidence, 8 perceptions). Differences were assessed using a Wilcoxon Signed-Ranks test. **Results:** All students (N=34, 100% response rate) had significantly higher confidence on all items post-activity ( $p < 0.001$ ) and improved perceptions on four items ( $p < 0.05$ ). Items that did not show significant improvement already had a median of 6 or higher. **Implications:** Students entering their oncology module lack confidence in several areas, yet this interactive activity significantly increased students confidence to handle oncology scenarios they may experience on advanced pharmacy practice experiences and in future practice settings. Additionally, this activity expanded students' perceptions of pharmacists' involvement in oncology. Most notably, this significantly increased students' ability to navigate resources to answer oncology-related questions.

**The Relationship Between Prior Experiences in Mathematics, Confidence in Mathematical Ability, and Pharmacy School Success.** Kelly Conn, *St. John Fisher College*, Christine R. Birnie, *St. John Fisher College*, David J. McCaffrey, *St. John Fisher College*, Jack Brown, *St. John Fisher College*. **Objectives:** Objectives of this study were to assess students' pre-pharmacy math experiences, confidence in math ability, and the relationship between experiences, confidence, and grades in math-based pharmacy courses. **Method:** A cross-sectional survey of P1-P3 PharmD students was conducted. Students reported type of pre-pharmacy math courses taken, when they were taken (high school (HS) vs. college) and year of HS and college graduation. Students rated their confidence in math ability using the previously validated 11-item Fogarty Math Confidence Scale (Cronbach alpha=0.92). Math grade point average (GPA), Pharmacy College Admission Test quantitative (PCAT quant) scores, and grades (calculations and kinetics) were obtained from transcripts and school records. Spearman correlation and multivariate linear regression were used to compare math experiences, confidence, and grades. **Results:** Students (n=198, 85% response rate) reported 7.1 years since HS graduation and 2.9 years since their last schooling prior to pharmacy school. Students with more time since HS / last schooling had lower calculations and kinetics grades ( $p$ -values < .02). Students reporting more HS math courses had better calculations grades ( $\rho = .290$ ,  $P < 0.001$ ). Additionally, students with higher Math GPA, and PCAT quant scores also had higher calculations

and kinetics grades ( $p$ -values < .01). Greater confidence in math ability was associated with higher calculations grades ( $\rho = .259$ ,  $P < 0.001$ ). In multivariate regressions, PCAT quant scores independently predicted calculations and kinetics grades after controlling for confidence, years since HS, and total HS math courses taken. **Implications:** The number of pre-pharmacy math courses and time elapsed since they were taken are important factors to consider related to success in math-based pharmacy school courses.

**Using International Disease, Disasters and Pandemics to Teach Public Health.** Stephanie Lukas, *St. Louis College of Pharmacy*, Peter D. Hurd, *St. Louis College of Pharmacy*. **Objectives:** Determine the acceptance of case studies and group projects related to international diseases, disasters and pandemics among students in a public health course in a college of pharmacy. **Method:** In fall 2016, St. Louis College of Pharmacy began offering a required, first-professional-year, public health course. International topics were included such as diseases (cholera, malaria, TB, measles and polio); research project proposals; and a Rwandan genocide lecture, which included a warning about the graphic nature of the material. We will focus on the evaluation given by the students after the genocide lecture. **Results:** Each semester, students were given 12 research proposal topics to select from – with one international topic. Eight out of the 34 students (23.5%) in the fall and 20 out of 79 (25.3%) in the spring chose public health in South Africa, making it the most popular of the group projects. The Rwandan genocide lecture included public health concepts such as emergency management, health disparities and education. Upon completion, 100% of the class found the lectures educational and thought it should be included in future semesters. 66.7% thought the topic correlated with other lectures in the course, 33.3% thought it correlated slightly and 0% thought it was unrelated. **Implications:** International topics were of interest to students. These case studies such as the Rwandan genocide expand students' thinking; 90% of students responded in the affirmative to this on evaluation. We will continue to offer these and additional international examples to expand students' understanding of public health and their worldview.

**Using Predictive Analytics to Inform the PharmD Admission Process.** Samuel C. Karpen, *East Tennessee State University*, Steve C. Ellis, *East Tennessee State University*. **Objectives:** To predict applicants' performance during their Fall P1 semester using random forest analysis. **Method:** The researchers downloaded three years of matriculant data from WebAdmit, to which they appended the corresponding fall P1 GPAs. The researchers used R to conduct a random forest analysis. **Results:** Our analyses showed that students who achieved less than a 3.0 GPA during the fall of their P1 year fell into three groups: 1. Achieved a pre-pharmacy science GPA below 2.6 and a Chemistry PCAT score below 58 2. Achieved a pre-pharmacy science GPA below 2.9, a Chemistry PCAT score below 58, and a Reading PCAT score below 74. 3. Achieved a pre-pharmacy science GPA above 3.1, but a Chemistry PCAT score less than 80, attended a community college, and received a Quantitative PCAT score less than 42. Additionally, our analyses showed that of the all of the variables that we downloaded from WebAdmit, pre-pharmacy science GPA, Chemistry PCAT, Reading PCAT, and Quantitative PCAT, had the strongest influences on fall P1 GPA. While we included many other variables in the analysis, the algorithm only retains variables that are significantly related to fall P1 GPA. **Implications:** Random forest analysis is often superior to regression in that it can examine multiple interactions among variables and provide meaningful importance scores for each variable. Indeed, several universities (e.g., Georgia State) have already adopted similar techniques and seen higher graduation rates.

Furthermore, both the 2013-2014 Academic Affairs Committee and the 2014-2015 Argus Commission have encouraged the adoption of big data analytics by pharmacy educators.

#### **What Qualifications and Skills Are Important for Pharmacy Assessment Deans and Directors? A Job Advertisement Analysis.**

Fadi M. Alkhateeb, *Texas A&M University*, Annesha White, *University of North Texas System*, Michael J. Rudolph, *Marshall University*.

**Objectives:** The purpose of this study was to explore and describe the nature of assessment job positions in US colleges and schools of pharmacy with regard to educational background, experience, training, academic rank, and responsibilities. A secondary objective was to compare pharmacy schools opened prior to 2010 to those opened after 2010. **Method:** This exploratory study examined job announcements published between 2012 and 2016 on the AACP website, HigherEdJobs, and College of Pharmacy websites. Advertisements containing either the word “coordinator”, “Director” or “Assistant/Associate Dean” or “Assessment” and “Accreditation” in the position title were included in the analysis. **Results:** Twenty-six pharmacy assessment administrator positions were analyzed. The most common titles were Associate Dean (19%), Assistant Dean (35%), and Director/coordinator (23%). Most positions specifically required a PhD (23%) or either a PhD or PharmD (31%). Minimum years of related experience was generally 5 years or less (42%) or not specified (54%). Key themes for desired skills/experience included: knowledge of assessment methods, accreditation standards, and data analysis; prior assessment experience; and strong interpersonal skills. Themes for job responsibilities included: oversee school assessment program; develop/implement assessments; lead/support accreditation activities; gather, analyze, and report on assessment data; chair or serve on assessment committee; and foster a culture of assessment. Many positions also included a faculty appointment. **Implications:** The results of this study should be of interest to deans of pharmacy colleges anticipating staffing needs, and individuals interested in understanding trends in the nature of work in academic assessment.

#### **Theoretical Models**

##### **A Patient-Centered Conceptual Model for Investigating the Outcomes of Pain Self-Management.**

David Rhys Axon, *The University of Arizona*, Mira Patel, *The University of Arizona*, Marion K. Slack, *The University of Arizona*.

**Objectives:** To describe a patient-centered conceptual model to guide research into the number and types of strategies that individuals use to self-manage chronic pain and to describe the outcomes of pain self-management strategies. **Method:** Pertinent literature was reviewed to identify models and components of pain self-management, particularly the types of self-management strategies used and the potential outcomes of self-management. **Results:** The model consists of four linear components: 1) demographic characteristics, 2) pain characteristics, 3) management strategies, and 4) outcomes. The earlier components may have a direct or indirect effect on outcomes. Demographic characteristics include age, sex, marital status, health status, and knowledge, which influence pain characteristics. Pain characteristics depend on the cause of pain, intensity of pain, duration of pain, and comorbid pain. Five categories of management strategies were identified: medical, medications, physical, psychological, and non-medical strategies. Medical strategies include treatment obtained through the health care system, such as surgery or steroid injections. Medications include prescription and non-prescription medications. Physical strategies include physical therapy, exercise, massage, heat/cold application, and acupuncture. Psychological strategies address behavioral, emotional, and cognitive

components of chronic pain. Non-medical strategies include alcohol use, no treatment, diet, dietary and herbal supplements, and avoiding certain activities. Outcomes include pain intensity, emotional and physical function, interference, and adverse events. **Implications:** This model enhances existing models by providing a conceptual framework that facilitates investigation into the types, amounts, and effectiveness of pain self-management strategies, and to explore relationships between demographic characteristics and use of different strategies and outcomes.

##### **Getting Students on the SHIP to Helping Patients Make Informed Medicare Decisions.**

Catherine Oswald, *Roseman University of Health Sciences*, Graciela Meza, *Roseman University of Health Sciences*, Michelle Hon, *Roseman University of Health Sciences*.

**Objectives:** Demonstrate how colleges and schools of pharmacy can partner with their local State Health Insurance Assistance Program (SHIP) to train and empower future pharmacists to assist Medicare beneficiaries with selecting cost-effective plans in an unbiased manner. **Method:** Student pharmacists and faculty partnered with SHIP in 2015 to create an on-campus, student-led, volunteer Medicare call lab. Free and unbiased training, provided by the Nevada SHIP office, consists of 16 hours of didactic-based learning, a series of electronic assessments, and 12-25 hours of supervised live calls. Fully trained student callers assist beneficiaries by screening and enrolling participants into appropriate and cost effective medical insurance plans, supplemental plans, prescription drug plans, and when appropriate extra assistance programs based on each individual's unique needs. **Results:** Between 2015 - 2016, 78 students signed up to participate in the SHIP training and volunteer time in the Medicare Call Lab. In 2016, student pharmacists and SHIP trainers spent 389 hours of time on the phone and reached 581 beneficiaries. This program provided a combined estimated annual savings of \$416,000 for 389 of the beneficiaries it served during the last 6 months of 2016. **Implications:** Medicare is a complex program to navigate and with proper training student-pharmacists can help these patients make informed decisions. SHIP is a federal program that exists in every state. There is an opportunity for colleges and schools of pharmacy to replicate this Medicare call lab and training structure, empowering more future pharmacists to be prepared to assist Medicare patients in obtaining cost effective health care.

##### **“I Know It When I See It” Is the Wrong Way to Assess the Co-Curriculum.**

Amy Ives, *University of Maryland*, Lisa Lebovitz, *University of Maryland*.

**Objectives:** To clearly document exposure to and assessment of ACPE Standards 3 and 4 components. **Method:** ACPE Standards 2016 requires schools and colleges of pharmacy to develop, implement, and document student competency in affective domain-related expectations. The Maryland PharmD curriculum is permeated with activities that develop affective domain skills; faculty also encourage students to immerse themselves in civic engagement and service. P4 students and a supervising faculty mapped co-curricular exposures and assessments, and determined how to educate and stimulate students about the importance of developing affective domain skills within and beyond the classroom. **Results:** Students observe and practice the key elements of ACPE Standards 3 and 4 in most required didactic courses and nearly all electives; faculty use formative and summative assessment techniques including examination, presentation, group exercises, and OSCEs. Experiential learning faculty also teach and assess development of the affective domain on IPPEs and APPEs, and P4 students practice continuing professional development with written reflections after each APPE block. Maryland pharmacy students are known on campus as the most engaged student body; 96% report membership in at least one of 20+ active student organizations

and 55% are officeholders. Over 50% report membership in 3 or more organizations, and 30% hold an office in more than 1 organization. Students reflect on participation in events and activities in their semester Plan of Study, and discuss experiences with group and individual advisors. An educational poster was created to inspire students to embrace the co-curriculum. **Implications:** This technique can be utilized to demonstrate accreditation compliance.

**“THE Map” – CAPE Outcomes, ACPE Standards 1-4, Pre-APPE Domains, APPE Expectations, PPCP, EPAs, and NAPLEX.** Lisa Lebovitz, *University of Maryland*, Katherine A. Kelley, *The Ohio State University*, Amy Ives, *University of Maryland*, Kristin A. Casper, *The Ohio State University*, Julie E. Legg, *The Ohio State University*. **Objectives:** To create a template crosswalk of relevant professional and educational outcomes, in order to facilitate curricular mapping of program-specific student learning outcomes by colleges and schools of pharmacy. **Method:** Assessment professionals, pharmacy faculty, staff and P4 students at two institutions collaborated to develop the crosswalk. Building on an existing map of program-specific outcomes to the CAPE and ACPE Standards 1-4, teaching rotation students in consultation with practice faculty added the steps of the Pharmacists’ Patient Care Process (PPCP), Entrustable Professional Activities (EPAs) and NAPLEX competencies. Faculty and staff at the second school added the pre-APPE Domains listed in ACPE’s Standards 2016 Guidance document Appendix A, and APPE activities delineated in Guidance 13f. Assessment professionals and faculty from each school devised procedures for mapping the local level outcomes to the crosswalk. Both institutions completed the mapping of their individual outcomes using these processes. **Results:** The crosswalk map provides a structured framework to guide program-specific curricular design, implementation, oversight, and continuous quality improvement. **Implications:** “THE Map” and the mapping process can be utilized to ensure optimal achievement of PharmD educational outcomes, and communicate programmatic expectations to their students within the broader context of accreditation requirements and the development of entry-level professional expectations. “THE Map” also provides faculty a convenient way to view how required guidance documents connect with their local program-level outcomes. “THE Map” will be made available to all colleges and schools of pharmacy.

## 2015-2016 AACP NEW INVESTIGATOR AWARD WINNERS

### Biological Sciences

**Anti-Myeloma Effect of Caffeic Acid Phenethyl Ester: The Role of Oxidative Stress.** Xinyu Wang, *Philadelphia College of Osteopathic Medicine*. **Objectives:** Multiple myeloma (MM) is a blood cancer featured with accumulation of malignant plasma cells in the bone marrow. Caffeic acid phenethyl ester (CAPE) is reported with anti-cancer potential in various malignancies. Anti-myeloma effect of CAPE, however, is not well studied. Our objectives were to determine the effect of CAPE on MM cell growth and explore the mechanism of CAPE action. **Method:** The anti-myeloma effect of CAPE was evaluated in three MM cell lines: RPMI8226, U266 and NCI-H929. The apoptosis of RPMI8226 cells induced by CAPE was evaluated through caspase-3 activation and western blotting examination of apoptosis-related proteins including Bax, Bak, PARP, Mcl-1, Bcl-X, and Bcl-2. The involvement of oxidative stress was assessed by antioxidant intervention using N-acetyl-L-cysteine, direct measurement of reactive oxygen species (ROS) and Glutathione level, and inhibition of Nrf2 activation using inhibitors trigonelline and Luteolin. **Results:** CAPE

inhibited growth of MM cells, while did not affect growth of normal human peripheral blood B cells. Apoptosis of RPMI8226 cells induced by CAPE was confirmed through activation of caspase-3, Bax and PARP proteins, and down-regulation of Mcl-1 and Bcl-X proteins. Pretreatment of N-acetyl-L-cysteine ameliorated cytotoxicity of CAPE in RPMI8226 cells. Intracellular level of ROS was decreased following CAPE treatment. Pretreatment of buthionine sulfoximine, a glutathione synthesis inhibitor, enhanced cytotoxicity of CAPE. Inhibition of Nrf2 sensitized RPMI 8226 cells to CAPE cytotoxicity. **Implications:** Results indicate that CAPE inhibited MM cell growth through induction of apoptosis and involvement of oxidative stress, which may provide an insight into the anti-myeloma mechanism of CAPE action.

### Brain Kappa Opioid Receptors and Aversive Effects of Nicotine.

Melissa Ward, *Ohio Northern University*, Saleh Alqifari, *Ohio Northern University*, Manoranjan D’Souza, *Ohio Northern University*. **Objectives:** To assess the role of kappa opioid receptors (KORs) in specific brain regions in the aversive effects of nicotine. **Method:** Nicotine-induced aversive effects were measured using the conditioned taste aversion model, which utilizes two unsweetened flavored solutions (e.g. grape and cherry) and a conditioning procedure. In the first series of experiments, Wistar rats were pretreated with either a KOR agonist  $\pm$ U50488 or antagonist norBNI prior to conditioning with nicotine (0.4 mg/kg, base; s.c.). In the next series of experiments, different doses of the KOR agonist  $\pm$ U50488 were injected directly either in the nucleus accumbens (NAcc) or ventral tegmental area (VTA) prior to conditioning with nicotine. Preference for a flavored solution was determined before and after conditioning with nicotine and saline. Changes in preference for the nicotine-associated flavored solution was used as an index of nicotine-induced aversive effects. **Results:** Pretreatment with the KOR agonist (0.3 mg/kg, s.c.) increased the aversive effects of nicotine. Importantly, blockade of the KORs using norBNI (30 mg/kg, s.c.) attenuated nicotine-induced aversive effects. Aversive effects of nicotine were increased by direct injections of the KOR agonist (3  $\mu$ g/0.5  $\mu$ l/side) into the NAcc and decreased after direct injections of low doses (0.3  $\mu$ g/0.5  $\mu$ l/side) of the KOR agonist directly into the VTA. **Implications:** Taken together, these data suggest that KORs can be used to promote smoking cessation by increasing the aversive effects of nicotine. Importantly, the data suggest opposite roles for the KORs in the NAcc and VTA in the aversive effects of nicotine.

### CaV1.2 Interaction With Polycystin-2 in Primary Cilia Is Required for Cardiac Function.

Wissam A. AbouAlaiwi, *University of Toledo*, Brian Muntean, *Scripps Institute*. **Objectives:** Primary cilia are sensory organelles that function as calcium signaling compartments. Among other organ systems, primary cilia have been shown to play important roles in hepatic, pancreatic, renal and vascular systems. However, the role of primary cilium in cardiac function was previously unexplored. The hallmark of cardiac myocytes is their excitable properties, which depend on calcium influx through voltage gated L-type calcium channels (CaV1.2). **Method:** Immunoprecipitation of wild-type mouse heart lysates with anti-CaV1.2 or anti-polycystin-2 (PC2) antibodies was used to reveal interaction between CaV1.2 and PC2. Immunofluorescence of mouse embryonic cardiomyocytes was used to reveal localization of CaV1.2 and PC2 to primary cilia. The role of PC2 on calcium-induced contractile force was confirmed with the phosphorylation index of myosin light chain (MLC) in intact hearts. Cardiac output was calculated based on heartbeat and contractility of ventricle. **Results:** We show that CaV1.2 interacts and colocalizes with PC2 in myocyte primary cilia. The CaMKII and

PDZ domains of CaV1.2 interact with the EF-hand of PC2. Furthermore, myocyte ciliary localization of CaV1.2 requires PC2. Our studies indicate that there are two distinct pools of myocyte CaV1.2 which are localized in the T-tubule and primary cilia. Restoring calcium level in cardiac myocytes reinstates myosin light chain phosphorylation, biochemical readout for heart contractility. **Implications:** Our findings suggest that PC2 is a critical modulator of CaV1.2 localization to primary cilia. We propose that localization of CaV1.2-PC2 complex to primary cilia plays an essential role in cardiac contractility, which is necessary to maintain cardiac function.

**Development of Novel Inhibitors of Mammalian Heterochromatin Gene Repression.** Ian A. MacDonald, *University of North Carolina at Chapel Hill*, Kyle V. Butler, *Icahn School of Medicine at Mount Sinai*, Jian Jin, *Icahn School of Medicine at Mount Sinai*, Stephen V. Frye, *University of North Carolina at Chapel Hill*, Nathaniel A. Hathaway, *University of North Carolina at Chapel Hill*. **Objectives:** We sought to identify novel molecular components involved in the heterochromatin gene repression pathway. This epigenetic pathway is required for mammalian development and has been found dysregulated in human cancer. **Method:** To study these processes in a physiologic setting, we developed a cell based assay that uses chemical-mediated recruitment of Heterochromatin Protein-1 (HP1) to an active endogenous gene. This technique stimulates heterochromatin formation and allows visualization of the repressive transformation at the target gene in real time. We combine our technology with a high-throughput flow cytometry based screening approach to identify new small molecule inhibitors that block heterochromatin formation. **Results:** Our top two hit compounds resulted in significantly decreased levels of global H3K9me3 (a signature mark of heterochromatin) and have good dose dependent profiles in our biological assays. One compound, UNC617, is a potent inhibitor of the histone methyltransferase G9a, which is known to be involved in the heterochromatin pathway and validates our approach. To identify the target of our other top compound UNC2524, we employed chemical affinity purification followed by quantitative mass spectrometry. This resulted in the identification of two proteins that were previously unknown to participate in heterochromatin gene repression. Inducible knockdown experiments confirmed the role for each of these proteins in heterochromatin gene repression. **Implications:** Our chemical genetic approach identified new components to a critical pathway in mammalian development. These new tools are being used to generate a better model of the molecular order of events in heterochromatin gene repression during development and disease.

**Insights From Breast Cancer Gene-Panel Screening Using a Newly Established Alabama Cohort.** Madison R. Chandler, *Auburn University*, Anna Huskey, *Auburn University*, Amit Shah, *Auburn University*, Melissa Shively, *Auburn University*, Erin P. Bilgili, *Auburn University*, Ebony Jackson, *Auburn University*, Kathleen Daniell, *Auburn University*, Elizabeth Stallworth, *Auburn University*, Stephanie Spina, *Auburn University*, Kasey Shepp, *Auburn University*, Amber Davis, *East Alabama Medical Center*, Holly Dean, *East Alabama Medical Center*, Brandon Johnson, *East Alabama Medical Center*, Nancy D. Merner, *Auburn University*. **Objectives:** An average US woman has a 12.5% lifetime risk of developing breast cancer (BC); many risk factors contribute towards one's lifetime risk, including genetic factors. Inherited genetic risk factors result in familial BC and are grouped into three general categories: high, moderate and low risk variants based on their increase in relative risk compared to an average US woman. Genes harbouring these risk variants are called BC susceptibility genes. To date, over 35 BC susceptibility genes that

carry high to moderate BC risk variants have been suggested. In general, variants in these susceptibility genes only explain ~35% of hereditary BC cases; however, less information is known about how such variants contribute towards BC in ethnic minority and underserved populations, which we aim to better understand. **Methods:** Two recruitment mechanisms, hospital and community-based recruitment, have been established to involve the medically underserved and underrepresented Alabama population in BC genetic research. A custom-designed next generation sequencing gene-screening panel was designed to screen known and candidate susceptibility genes. Rare and potentially pathogenic variants in clinically/statistically significant susceptibility genes were validated through PCR and Sanger sequencing. **Results:** After two years of recruitment, 177 participants from 111 cancer families have joined the study. Forty-three individuals (23 African American and 20 Caucasian) had gene-panel screening, and, thus far, 96% of the panel-detected variants have been confirmed through validation. Interestingly, over 80% of the validated variants are in AAs. **Implications:** This effort will help determine population differences and better predict BC risk in the future.

## Chemistry

**Targeting DXP Synthase Using ThDP Mimics to Develop Newer Antibiotics.** Anand Sridhar, *St. John Fisher College*. **Objectives:** Design, synthesis and biological evaluation of a focused library of thiamine diphosphate mimics as DXP synthase inhibitors. **Method:** Structure-based ligand design methods were used to create, dock, and rank a virtual library of thiamine diphosphate mimics. This was accomplished using the available x-ray protein crystal structure of DXP synthase and the computational program, AutoDock Vina. Viable compounds (as determined by docking poses and rank) were synthesized using existing literature methods, including copper-mediated 'click' chemistry. Commercially available chemicals were used to synthesize some of the precursor molecules, which were then scaled up for constructing the compound library. The synthesized compound library was evaluated using a battery of gram-positive and gram-negative bacteria. **Results:** Docking scores were used to identify suitable chemical scaffolds as potential DXP synthase inhibitors. A specific subset library was synthesized in the PIs laboratory in modest to above-average yields, ranging from 50–85%. The compound library, along with appropriate positive and negative controls, was subjected to MIC assays using a bacterial screen and the disk diffusion assay method. The overall results will demonstrate the validity of our model based on relationships between the docking scores and assay results. **Implications:** The current docking model has yielded compounds that possess modest bioactivity. The structure-activity relationship will help the identification and refinement of lead structures to obtain potent inhibitors of DXP synthase.

## Experiential Education

**Evaluating the Utility of Mimycx to Advance Interprofessional Experiential Education.** Joseph A. Zorek, *University of Wisconsin-Madison*, Shobhina Chheda, *University of Wisconsin-Madison*, Paula Jarzemsky, *University of Wisconsin-Madison*, Susan Wenker, *University of Wisconsin-Madison*, Kevin Wyne, *University of Wisconsin-Madison*. **Objectives:** To evaluate the impact of Mimycx, a multi-player online serious game, on early learners' perceptions and competencies related to interprofessional education (IPE), and to assess students' impressions of the game's utility. **Method:** In this intention-to-treat analysis, a convenience sample of 50 first and second year students was assembled into 10 teams, each consisting of one nursing, medical, pharmacy, physical therapy, and physician assistant student. Teams collaborated

remotely, yet synchronously, on three patient cases (i.e., “Quests”). Pre- and post-intervention questionnaires composed of three validated IPE measurement instruments (IEPS, SPICE-R2, and VCU-IPEC-v3) were administered. Mean change scores with effect sizes and reliabilities were calculated for each instrument. Themes were identified from team debriefing sessions. **Results:** Students’ average age was 24.1 (SD 3.1) years. The majority were white (88%), female (58%), and in their first year of study (68%). Students reported an average of 3.3 (1.05) hours on study tasks and 1.86 (0.76) hours interacting in the game environment. Eight students (16%) were unable to complete the intervention due to technical difficulties. No change in mean scores was observed with IEPS following participation (Cohen’s  $d=0.01$ ,  $p=0.9237$  [Cronbach’s  $\alpha=0.84$ ]). However, large effect sizes with significant score increases were observed with SPICE-R2 ( $d=0.9$ ,  $p<0.0001$  [ $\alpha=0.74$ ]) and VCU-IPEC-v3 ( $d=0.86$ ,  $p<0.0001$  [ $\alpha=0.88$ ]). Excluding technical and design issues, students’ impressions of the intervention were positive. **Implications:** Mimyx is a promising IPE learning environment capable of impacting perceptions and competencies of early learners. The impact and utility of this product is expected to grow as its functionality matures.

#### Pharmaceutics

**Novel and Targeted Prodrug Strategy for the Treatment of Resistant Ovarian Cancer.** Jianjun Chen, *Chicago State University*. **Objectives:** Current mitotic inhibitors such as paclitaxel are mainstream chemotherapeutic agents for ovarian cancer, however, they suffer from several issues like toxicity and drug resistance. The objective was to synthesize a novel prodrug HA-ADH-ABI that can be selectively delivered to ovarian cancer cells and has the potential to overcome the aforementioned problems. **Method:** First, the prodrug was synthesized. The purity and identity the prodrug was assessed by proton NMR; Second, in vitro bio-reversion study of the prodrug in plasma and acidic buffer was performed; lastly, the in vitro cytotoxicity and cellular uptake of the prodrug was evaluated in various ovarian cancer cell lines and normal fibroblast cells using MTS assay. **Results:** The originally proposed prodrug HA-ADH-ABI could not be synthesized due to low reactivity of the reactants, however, a slightly different prodrug (HA-NH<sub>2</sub>NH<sub>2</sub>-ABI) with a hydrazine linker was synthesized as an alternative. The in vitro bio-reversion study of the prodrug indicated that the prodrug is stable in human plasma and can release the active drug ABI after incubating in acidic phosphate buffer. The in vitro cytotoxicity showed that the prodrug was less active than the free ABI due to poor cellular uptake of the prodrug. **Implications:** This project demonstrated that targeted delivery of a non P-gp substrate can potentially overcome P-gp mediated drug resistance and reduce toxicity. Upon further modification with improved PK/PD properties, the prodrug has the potential to be developed into therapeutics for resistant ovarian cancer.

**PEG-Lipid Micelles Enable Cholesterol Efflux in Niemann Pick Type C1 Disease-Based Lysosomal Storage Disorder.** Anna Brown, *Oregon State University*, Siddharth Patel, *Oregon State University*, Conroy Sun, *Oregon State University*, Gaurav Sahay, *Oregon State University*. **Objectives:** 2-Hydroxy-propyl- $\beta$ -cyclodextrin (HP $\beta$ CD), a cholesterol scavenger, is currently undergoing Phase 2b/3 clinical trial for treatment of Niemann Pick Type C-1 (NPC1), a fatal neurodegenerative disorder that stems from abnormal cholesterol accumulation in the endo/lysosomes. Unfortunately, the extremely high doses of HP $\beta$ CD required to prevent progressive neurodegeneration exacerbates ototoxicity, pulmonary toxicity and autophagy-based cellular defects. **Method:** We created a small set of two-component liposomes

from phospholipids and distearyl-phosphatidylethanolamine conjugated with polyethylene glycol (DSPE-PEG), a common PEG-lipid known to improve nanocarrier stability. Intracellular cholesterol efflux from the NPC1 based cell lines was measured using a fluorescent-based high content screening and total cholesterol levels were measured using spectrophotometric assays. **Results:** We present unexpected evidence that a poly (ethylene glycol) (PEG)-lipid conjugate enables cholesterol clearance from endo/lysosomes of *Npc1* mutant (*Npc1*<sup>-/-</sup>) cells. Herein, we show that distearylphosphatidylethanolamine-PEG (DSPE-PEG), which forms 12-nm micelles above the critical micelle concentration, accumulates heavily inside cholesterol-rich late endosomes in *Npc1*<sup>-/-</sup> cells. High-throughput screening revealed that DSPE-PEG, in combination with HP $\beta$ CD, acts synergistically to efflux cholesterol without significantly aggravating autophagy defects. These well-known excipients can be used as admixtures to treat NPC1 disorder. Increasing PEG chain lengths from 350 Da-30 kDa in DSPE-PEG micelles, or increasing DSPE-PEG content in an array of liposomes packaged with HP $\beta$ CD, improved cholesterol egress, while Pluronic block copolymers capable of micelle formation showed slight effects at high concentrations. **Implications:** PEG-lipid based nanocarriers can serve as bioactive drug delivery systems for effective treatment of lysosomal storage disorders.

#### Pharmacy Practice

**Changing Epidemiology in Cirrhotic Patients With Spontaneous Bacterial Peritonitis.** Amelia K. Sofjan, *University of Houston*, Rachel J. Musgrove, *University of Houston*, Nicholas D. Beyda, *University of Houston*, Hannah P. Russo, *CHI Baylor St. Luke’s Medical Center*, Todd M. Lasco, *CHI Baylor St. Luke’s Medical Center*, Raymond Yau, *CHI Baylor St. Luke’s Medical Center*, Alejandro Restrepo, *Baylor College of Medicine*, Kevin W. Garey, *University of Houston*. **Objectives:** The prevalence of spontaneous bacterial peritonitis (SBP) due to third-generation cephalosporin (3GC)-resistant organisms has not been well studied in the United States (US). This study aimed to assess the prevalence, predictors, and outcomes of 3GC-resistant SBP at a large tertiary center in the US. **Method:** This 1:1:4 case-case-control study included 141 adults with liver cirrhosis admitted from 11/2011 to 03/2016. Case group 1 were patients with SBP with a 3GC-resistant organism (n=21). Case group 2 were patients with SBP with a 3GC-susceptible organism (n=26). Control group were patients without SBP (n=94). **Results:** The prevalence of 3GC-resistant SBP was 45% (21/47). Independent predictors of 3GC-resistant SBP included duration (in days) of  $\beta$ -lactam therapy in the past 90 days (adjusted odds ratio [aOR], 1.07; 95% confidence interval [CI], 1.01-1.13) and recent invasive gastrointestinal procedure (aOR, 12.47; 95% CI, 2.74-56.67). Thirty-six percent of patients with SBP received inappropriate empiric therapy, which occurred more often in patients with 3GC-resistant organisms (aOR, 6.17; 95% CI, 1.41-27.02). Mortality was higher in patients with 3GC-resistant SBP (38% [8/21]) than in patients with 3GC-susceptible SBP (4% [1/26]),  $p=0.006$ . The main predictor of mortality was inappropriate empiric therapy (aOR, 10.14; 95% CI, 1.71-60.04). **Implications:** The prevalence of 3GC-resistant SBP was high at a US tertiary center. The main modifiable risk factor for 3GC-resistant organisms and mortality is previous antibiotic use and appropriateness of empiric antibiotics, respectively. Clinicians should evaluate local resistance rates, identify patients at risk for 3GC-resistant SBP, and administer appropriate empiric therapy to optimize outcomes.

#### Social and Administrative Sciences

**Characteristics of New Hepatitis C Virus Therapy Utilization in a Large Medicaid Program.** Wei-Hsuan Lo-Ciganic, *The University*

of Arizona, Julie M. Donohue, *University of Pittsburgh*, Daniel C. Malone, *The University of Arizona*, Walid F. Gellad, *University of Pittsburgh*. **Objectives:** Second-generation direct-acting antiviral agents (DAAs) are highly effective but costly for hepatitis C virus (HCV) infections. Medicaid pays for a large share of DAA prescriptions, particularly after 31 states expanded Medicaid under the Affordable Care Act. Little is known about whether characteristics of Medicaid enrollees using DAAs changed during a period of new DAA introductions and program expansion. **Method:** We identified adult Pennsylvania Medicaid enrollees initiating DAA therapy from 2013-2015. We examined patterns of DAA use, patient characteristics and prescriber specialty before and after implementation of the Medicaid expansion (1/2015), using analysis of variance and Chi-square test. **Results:** The number of DAA users increased 61% (1,102 in 2013-2014 to 1,783 in 2015), with 26.4% of DAA users in 2015 eligible through Medicaid expansion. The most commonly prescribed DAAs were sofosbuvir (68.4%) in 2013-2014 and ledipasvir/sofosbuvir (77.4%) in 2015. Characteristics were similar between DAA users in 2013-2014 and Medicaid-expansion users. In 2015, traditional-Medicaid DAA users were significantly older, black, and residents in southeast/southwest regions compared to Medicaid-expansion DAA users. Traditional-Medicaid DAA users in 2015 had a higher disease burden than expansion enrollees (e.g., frequent emergency department visits, higher prevalence of HIV/cirrhosis). More Medicaid-expansion patients received DAAs from PCPs compared to beneficiaries in 2013-2014 (18.5% vs.13.9%). The mean proportion of days covered was 0.84 (SD=0.2) and one-third patients had a 15-cumulative-days gap during the first 12 weeks. **Implications:** DAA utilization has substantially increased from 2013 to 2015. Changes in the eligibility and patient characteristics of Medicaid enrollees using DAAs have important implications for the total Medicaid spending.

**Characterizing the Professional Culture of Community Pharmacists in the United States.** Meagen Rosenthal, *The University of Mississippi*, Erin Holmes, *The University of Mississippi*. **Objectives:** Before community pharmacy practice can be successfully adapted to ensure all patients receive the benefit of pharmacists' interventions, the culture of community pharmacy must be fully understood. The primary objective of this study was to validate the organizational culture profile (OCP) in a sample of community pharmacists from the United States (US). **Method:** An online survey was administered to US community pharmacists. The survey contained questions regarding respondent characteristics and the provision of medication therapy management services, as well as the organizational culture profile (OCP). The OCP was analyzed using a principle components analysis (PCA). **Results:** 302 complete surveys were returned. The mean number of years in practice of respondents was more than 20 years and most were practicing in a chain pharmacy setting. The PCA revealed a 6-factor structure: social responsibility, innovation, people orientation, competitiveness, attention to detail, and reward orientation. Reliability analyses showed relatively high Cronbach's alphas ranging from 0.73 for attention to detail to 0.82 for innovation. The new factor structure was very similar to the structure identified in previous studies, however, two new factors were identified; people orientation and attention to detail. Comparing US community pharmacists to Canadian pharmacists, overlap was identified on social responsibility and competitiveness. Attention to detail was unique to the US community pharmacist respondents. **Implications:** Improving knowledge about of the professional culture of community pharmacists can inform whether or not pharmacists provide services such as MTM, as well as guide discussions changing the culture.

**Workflow Impact on Medication Errors During Care Transitions Between Rural Facilities.** Mark Patterson, *University of Missouri-Kansas City*, Sandra Bollinger, *Health Priorities, Inc.*, Janice Foust, *University of Massachusetts Boston*, Chandler Coleman, *University of Missouri-Kansas City*, Diepngan Nguyen, *University of Missouri-Kansas City*. **Objectives:** Improving medication reconciliation during transitions of care requires removing communication gaps associated with medication errors. Our objectives included 1) determining medication discrepancy rates during transitions between hospitals and nursing homes and 2) characterizing provider communication barriers associated with post-acute care medication reconciliation. **Method:** Discrepancy data collected during medication reconciliation included discrepancy type, medication class, and data source. Trends were measured using descriptive statistics. Twelve providers from nursing homes and hospitals participated in two separate focus groups to discuss communication barriers related to preventing and resolving medication discrepancies. Themes were identified using the Framework method. **Results:** 127 medication discrepancies were identified across 142 transitions of care. The most common discrepancies included omission, frequency, or dosage discrepancies across analgesic, cardiovascular, or gastro-intestinal and laxative medications. 36% of the discrepancies involved mismatched prescribing information between three care facilities. Focus group themes included 1) reliance upon external providers for timely and accurate data exchange, 2) inconsistent and incomplete data shared on incompatible forms, and 3) inefficient communication workflow during prescribing order changes. **Implications:** Mismatched prescribing information found across up to three care facilities illustrates significant communication gaps requiring solutions that increase accuracy. Reliance upon faxes or phones in the absence of electronic health information exchange challenges providers' ability to smoothly coordinate care across multiple settings. To best prevent and resolve medication discrepancies during post-acute care transitions, providers are advised to create standardized forms and communication protocols that facilitate timely and accurate information exchange.

## INNOVATIONS IN TEACHING AWARD - WINNERS

**Implementation of an Interprofessional Medication Therapy Management Experience.** Katherine E. Johnson, *The University of Arizona*, Janet H. Cooley, *The University of Arizona*, Stephanie Forbes, *The University of Arizona*, Ann M. Taylor, *The University of Arizona*, Robert Lipsy, *The University of Arizona*, Jessica DiLeo, *The University of Arizona*, Whitney Shields, *The University of Arizona*. The current literature on the integration of medication therapy management (MTM) within interprofessional education (IPE) programs is limited. To address this problem, the University of Arizona's Medication Management Center (UAMMC) developed an extended IPE experience for students attending the Colleges of Medicine, Nursing, Pharmacy, and Nutritional Sciences. All of these students are in the final year of their degree program (MD, BSN, PharmD, and BS, respectively) and participate through various avenues to best accommodate their core curriculum and other clinical rotations. This 3-day program spans three weeks, with students meeting on a weekly basis. This schedule allows students to work together in small, interprofessional groups to conduct MTM consultations for patients with complex chronic conditions, without significantly impacting their requisite courses and rotation schedules. Evaluation of student learning and attitudinal changes are measured via pre- and post-IPE student surveys. Effective student learning of clinical MTM skills and successful

interprofessional collaboration (IPC) are demonstrated by changes in the pre and post student surveys, high patient satisfaction, and implementation of complex clinical recommendations. This IPE program's innovative features include promoting interprofessional collaboration, providing active learning opportunities for acquisition of MTM-related knowledge and skills, aligning with health science students' course and rotation schedules, and providing a unique, engaging IPE experience.

**Value-Driven Pharmacy Student-Led Rapid Cycle Process Engagement in Experiential and Didactic Settings** Jennifer M. Malinowski, *Wilkes University*, Teresa Lacey, *Geisinger Commonwealth School of Medicine*, Linda Thomas, *The Wright Center for Primary Care*. **Background:** Leveraging pharmacy students to satisfy additional workload requirements introduced by quality metrics promotes a mutually beneficial relationship that complements the missions of the academic institution and the health care organization. **Objective:** To explain student pharmacist-led projects that apply rapid cycle quality improvement (QI) processes (the "Plan-Do-Study-Act" model) to demonstrate value in didactic and experiential settings. **Methods:** During a 5-week advanced pharmacy practice experience (APPE) in ambulatory care, students lead a small QI project focused on population health and/or medication safety. Project assignments are decided upon by previous APPE students and/or in collaboration with clinic staff. Recently, a primary care elective was developed for P2 and P3 students that incorporate similar principles used during the APPE rotation. A specialist in quality improvement taught students fundamentals of the PDSA process and self-directed learning and reflection was guided by outside readings that incorporated online quality improvement (QI) courses. Students applied the PDSA process to projects focused on unmet needs identified by local partners for a portion of their course grade. **Results:** Approximately 25% of the forty-three PDSAs completed were nominated or awarded with regional/national recognition. The data suggests that leveraging student pharmacists as system improvers helps to promote an accountable, innovative culture of learning in pharmacy education. **Conclusion:** Student pharmacist leadership of QI projects helps to satisfy some of the more challenging domains of leadership and innovation, entrepreneurship and self-awareness. Proactive engagement of academic partners to identify unmet needs that may be addressed by student pharmacists promotes a mutually beneficial relationship between academic and health care institutions.

## INNOVATIONS IN TEACHING AWARD – HONORABLE MENTION

**Development, Implementation and Lessons Learned From a Mock Trial as a Teaching and Assessment Activity.** Ettie Rosenberg, *West Coast University*, Hoai-An Truong, *West Coast University*, Audrey Hsu, *West Coast University*, Reza Taheri, *West Coast University*. **Background.** This innovative self-directed learning strategy reinforced evidence-based practice skills and affective domain competencies adopted by pharmacy educators in CAPE 2013 Outcomes and ACPE Standards 2016. **Objective.** To describe the development, implementation, and lessons learned from use of a mock trial as a teaching-learning and assessment activity in a required evidence-based practice course. **Methods.** Student-teams were assigned controversial topics to research, prepare and debate in a courtroom style format. As a self-directed group project and final exam, the mock trial requires the application of knowledge, skills, and attitudes derived from this and prior courses. The design offers teaching-learning and assessment of literature critique and evaluation, critical thinking, communication, teamwork, professionalism and self-awareness. Statistical

analysis, including inter-rater reliability, compared faculty-judge and student-juror evaluation of trial performance. **Results.** Two cohorts (97 students) debated four issues. Faculty-judges and student-jurors rated content/knowledge, critical thinking, application/discussion of federal/state law, citations/references, visual aids, delivery/style, and active listening. Evaluations indicated that students performed well with overall mean scores by judges and jurors above 54 out of 60 points (90%) in 2015 and above 51 out of 60 points (85%) in 2016. Judges' scores displayed a wider range than jurors' scores. Peer evaluation mean scores were above 55 out of 60 points in all four trials. Intraclass correlation was calculated. Judges scores had excellent interrater reliability in three trials, whereas jurors had good inter-rater reliability in one trial. **Conclusion.** Overall results show students performed well and were able to apply their knowledge, skills, and attitudes gained from previous required courses.

## AWARD FOR EXCELLENCE IN ASSESSMENT

**A Programmatic Model for Student and Faculty Assessment of Interprofessional Education Simulation Training.** Therese I. Poirier, *Southern Illinois University Edwardsville*, Miranda Wilhelm, *Southern Illinois University Edwardsville*, Katie Ronald, *Southern Illinois University Edwardsville*, Jingyang Fan, *Southern Illinois University Edwardsville*. **Introduction:** Error disclosure training was identified as a top priority for IPE. The purpose was to conduct a prospective evaluation of an error disclosure assessment tool along with review of video recordings to enhance student learning and metacognitive skills while assessing the IPEC competencies. **Methods:** The instruments for assessing performance in interprofessional error disclosure were developed. Assessment categories included planning, communication, process, and team dynamics. Student self-assessed these categories before and after viewing recordings of their encounters. Faculty used a similar instrument to conduct real-time assessments of communication, process, and team dynamics. An instrument to assess the IPEC core competencies was adapted from validated tools. Qualitative data was also reviewed to determine student and faculty perceptions of the interprofessional error disclosure simulation. **Results:** The interprofessional simulation training involved a total of 233 students (50 dental, 109 nursing and 74 pharmacy). Use of video recordings made a significant difference in student self-assessment for communication and process categories of error disclosure. There were significant differences between student self-assessment and faculty assessment for most paired comparisons. Students' perceptions of achievement of the IPEC core competencies were positive after completing an interprofessional error disclosure simulation. **Conclusion:** The use of assessment instruments and video recordings may have enhanced students' metacognitive skills for assessing performance in interprofessional error disclosure. This enhanced assessment process appeared to enhance learning about the skills needed for interprofessional error disclosure. The assessment process used for the IPE simulation training for meeting IPEC competencies demonstrates best practices in assessment.

**Blended Simulation Progress Testing for Assessment of Practice Readiness.** Neal Benedict, *University of Pittsburgh*, Pamela Smithburger, *University of Pittsburgh*, Amy Calabese Donihi, *University of Pittsburgh*, Philip Empey, *University of Pittsburgh*, Lawrence Kobulinsky, *University of Pittsburgh*, Amy Seybert, *University of Pittsburgh*, Thomas Waters, *University of Pittsburgh*, Scott Drab, *University of Pittsburgh*, John Lutz, *WISER Education and Simulation Facility*, Deborah Farkas, *WISER Education and Simulation Facility*, Susan Meyer, *University of Pittsburgh*. **Objective.** To design an



assessment of practice readiness using blended-simulation progress testing. **Design.** A five-station, blended simulation assessment was developed to evaluate patient care outcomes in first- and third-year pharmacy (P1 and P3) students, as well as first-year postgraduate (PGY1) pharmacy residents. This assessment of practice readiness included knowledge and performance evaluations administered as a progress test. **Assessment.** Knowledge and performance data was collected for 18 PGY1 residents, 108 P3 students, and 106 P1 students. P3 students scored significantly higher than P1 students across all evaluations. Third-year pharmacy students scored significantly lower than PGY1 residents in interprofessional communications and attitudes of ownership in a standardized colleague/mannequin model station, and in patient communication in a standardized patient station. **Conclusion.** Learners demonstrated evolving skills as they progressed through the curriculum. A blended simulation integrated progress test provides data for improvement of individual student clinical skills, informs curricular advancement, and aligns curricular content, process, and outcomes with accreditation standards.

**Developing an Innovative, Comprehensive First-1 Year Capstone to Assess and Improve Student Learning and Curriculum Effectiveness.** Adam M. Persky, *University of North Carolina at Chapel Hill*, Jessica M. Greene, *University of North Carolina at Chapel Hill*, Tom Angelo, *University of North Carolina at Chapel Hill*, Heidi Anksorus, *University of North Carolina at Chapel Hill*, Kathryn Fuller, *University of North Carolina at Chapel Hill*, Jacqueline E. McLaughlin,

*University of North Carolina at Chapel Hill.* **Objective:** To describe the development and implementation of an innovative, comprehensive, multi3 day module focused on assessing and providing feedback on student cognitive and interpersonal skill development and practice readiness after the first year of a Doctor of Pharmacy (PharmD) curriculum. **Methods:** Over a four-month period, a multi-day capstone assessment was developed to assess first year students' knowledge of course content, ability to find and apply information, and interpersonal skills, including teamwork and adaptability. The first-year capstone consisted of four parts. Knowledge was assessed through a closed-book 130-item multiple choice test. The ability to find and apply information was assessed using a 45-question open-book test. Interpersonal skills were assessed using a specially designed multiple mini-interview (MMI). The final part was a debriefing session that provided rapid-cycle feedback on capstone performance and a bridge between their just-completed first-year coursework and an about-to-begin two-month experiential immersion. **Results:** On the closed book assessment the average score was 75% and on the open-book assessment the average score was 68%. The majority of students had an appropriate level of interpersonal skills based on the MMI. Students viewed the assessment positively based on post-assessment surveys. The majority of students did not study for the assessment thus the results should reflect retention of knowledge and skills. **Conclusion:** The capstone was able to assess students on knowledge and skills and provide students with feedback on areas to focus on during their early immersion. Continued work is needed to ensure the process is transparent and cost-effective.