ADMINISTRATIVE SERVICES

Annual Course Reports: A Comprehensive Tool to Inform Program Evaluation and Curriculum Renewal
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Objective: In 2018, we developed and implemented a course report template to serve as a comprehensive tool to gather qualitative and quantitative data to support cyclical program evaluation and inform curriculum renewal. At the individual course instructor level, the course report serves as a reflective teaching tool and generates data on course changes. The primary objective of this study is to examine if the annual course reports identify strengths, challenges, and recommendations for quality improvement.

Methods: For the 2018-2019 academic year, we gathered data from the course reports and follow-up meeting notes with course instructors. NVivo was used to conduct thematic analysis of course report qualitative narrative and meeting notes. This was guided by the broad themes of strengths, challenges, and recommendations for quality improvement. This included data on student performance, student course evaluations, approaches to learning, teaching strategies, and assessments.

Results: Across all courses, the most common strengths identified were: 1) teaching methodologies (case/problem-based learning and small groups/workshops), and 2) the use of Learning Management System and other related technology. The main challenges identified were logistical issues (eg, scheduling). Finally, three major themes that emerged from recommendations for quality improvement were: 1) increase constructive alignment (eg, learning outcomes, content, etc.), 2) change course format/delivery, and 3) provide additional resources (eg, teaching assistants, clinical instructors, etc.).

Conclusions: Implementing the use of an annual course report centralizes important course data into a single document. This allows course coordinators and program leads to engage in meaningful dialogue to identify important emerging themes for consideration during annual course review and renewal.

Association Between Students’ Factors and Saudi Pharmacist Licensure Examinations’ (SPLE) Passing Rate: Cross-Sectional Cohort Study
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Objective: To evaluate the association between students’ demographics (eg, gender and age), prepharmacy factors (high school type, high school GPA, General Aptitude Test (GAT) score, Scholastic Achievement Admission Test (Science) (SAATS) Score), pharmacy school factors (eg, 1st year GPA, pharmacy GPA, pharmacy program type, and getting D or F grade) on the passing rate of SPLE.

Methods: Prepharmacy factors, 1st year GPA, pharmacy GAP, and pharmacy program type were retrieved from the college records, while other factors were reported by graduates. A t-test and correlational analyses and stepwise logistic regression were performed to examine the impact of various factors and their relationship on the passing of SPLE. Ethical approval was obtained from the University central institutional review board.

Results: Out of 120 participated graduates, 105 reported taken SPLE. The majority were female (52.38%) with a mean age of 22.5 years old. The mean SPLE score was 62.27 (SD 9.97). 77.14% of students reported taking SPLE once, out of which 82.02% got a passing score. There was no significant difference between males and females on the passing of SPLE (P-value =0.7505). We further examined the correlation between SPLE score and high school GPA, GAT, SAATS, pharmacy GPA. The results showed that the SPLE score was significantly correlated with pharmacy GPA (P-value <0.0001). The adjusted logistic regression (R² =0.2306) showed that pharmacy GPA and age were significantly associated with passing of SPLE (P-value equal to<0.0001 and 0.0287), respectively.

Conclusions: This single cohort
A Theme Based Co-Curricular Program to Enhance Pharmacy Students’ Soft Skills
Roy Kanbar, Lebanese American University, Ghada El Khoury, Lebanese American University, Patricia Habib, Lebanese American University, Imad F. Btaiche, Lebanese American University.

Objective: The Lebanese American University School of Pharmacy (SOP), together with the Office of Civic Engagement, launched a comprehensive co-curricular program (CCP) to reinforce students’ affective domain elements. Methods: The CCP encompasses required and optional co-curricular activities (CCA), longitudinally spread from first to fourth pharmacy professional year (PY) around a select affective domain theme. PY1 theme is self-awareness and personal development; cultural sensitivity and advocacy for PY2; interprofessional collaboration and communication for PY3 and leadership and innovation for PY4. Examples of offered CCAs are workshops, group discussions, reflections on articles and movies, as well as community service projects. Students’ progression, achievements, perceptions and skill-based self-reflections are documented and assessed through an online portfolio. Focus groups are also conducted for qualitative assessment. Results: During academic year 2018-19, 18 required and 10 optional CCA were offered to 253 pharmacy students from PY1 to PY4. Results show that 96% and 39% of students completed all required and at least one optional CCA, respectively. On average, each student completed 4 to 5 CCA over 15 hours. Students’ perception results show that 81% agreed that the CCP enhanced their soft skills and 82% indicated that CCA were an added value and enjoyment. When asked about specific soft skills covered, students ranked highest: self-awareness, communication, professionalism, teamwork and interprofessional collaboration. The 2 most important challenges facing the CCP were, scheduling CCAs outside of class and exams hours and commitment from faculty and students to offer and attend the different CCAs respectively. Conclusions: The described CCP provides a structured, organized, yet flexible, framework to fulfill accreditation requirements in developing and assessing students’ affective domains.

A University-wide Self-Directed Leadership Program in Pedagogy: “Faculty Learning Communities” to Achieve Technology-enhanced Teaching
Ashim Malhotra, California Northstate University, Tracy Yarbrough, California Northstate University, College of Medicine, Catherine Yang, California Northstate University.

Objective: To encourage incorporation of hybrid and online technology components in healthcare education courses, we designed a technology-focused Faculty Learning Community (FLC) for self-directed faculty development. Methods: Our six-week-long summer FLC engaged 40 faculty across colleges of Pharmacy, Medicine, Psychology, Dental Medicine, and Health Sciences in implementing design principles for creating hybrid and online courses. There were six weekly two-hour-long training sessions by experts in topics such as “elements of hybrid course design”, “use of Active Presenter for interactive lecture videos”, “assessment strategies for online and hybrid courses”, and “communication strategies for hybrid and online courses”. Each session included an hour-long lecture followed by working “hands-on” with experts to incorporate the discussed strategies into their courses. Supported by the University Vice President of Academic Affairs, the FLC also offered online Office Hours to aid attendees. A final session was reserved for participants to present courses in their respective disciplines that incorporated learning from the FLC. Results: We adapted the SALG instrument with 45 questions to survey the perception of the FLC. The response rate was 41%, with 80% respondents indicating that the FLC enabled 1) examination of the design, potential usage and steps for the implementation of online and hybrid technology platforms in their teaching, and 2) identification of an area of technology-assisted or distance learning to incorporate into their teaching, while 90% felt that the session facilitators 3) demonstrated expertise in their subject matter and 4) were responsive to questions, comments, and opinions. Suggested areas of improvement included time and resource allocation. Conclusions: The technology FLC was well received by faculty and was valuable in advancing the educational mission of California Northstate University.

Developing Student Pharmacist Motivational Interviewing Skills Using a Progressive Patient Case with Standardized Patients
Chasity M. Shelton, The University of Tennessee, Jamie Pitt, University of Tennessee Health Science Center, Dawn E. Havrda, The University of Tennessee.

Objective: To design and implement a progressive patient case to develop student pharmacist motivational interviewing (MI) skills and to assess students’ achievement of learning outcomes. Methods: A 3-part progressive patient case was developed and implemented in a skills-based course. Students initially practiced MI techniques using role-play. For two encounters using a
deconstructed model, groups of 6-8 students interviewed a standardized patient (SP) with formative feedback from peers and facilitators. For summative assessment, students were individually assessed during a final 10-minute SP encounter using the modified Master Interviewing Rating Scale (MIRS), a validated 5-point Likert scale communication rating tool with scores ranging from 1 (lacking skill) to 5 (skill mastery). For each item a score of 3 (developing skill) was set as the passing point. **Results:** Student performance (n=199) was assessed using 11 questions from the MIRS. For questions 1-9 (opening, question types, jargon usage, verbal skills and encouragement, non-verbal skills, empathy and acknowledging patient cues, encouragement of questions, assess motivation for changes, and organization) the median (interquartile ranges (IQR)) scores were 5(4-5). The median (IQR) scores for summarization and closure were 4(4-5) and 4(3-5), respectively. Overall, n=2 (1%) students required remediation. Collectively, students achieved a mean ± standard deviation score of 89.8% ± 9.0%. **Conclusions:** The addition of this progressive patient case with SPs allowed students to develop MI skills. Students consistently scored lower in summarization and closure indicating the allotted encounter time may have been inadequate. However, most students performed above the pre-determined passing point indicating the potential need for a higher passing point. Based on overall class performance, using a stricter passing point of 80.8% would have resulted in n=36 (18.1%) students requiring remediation.

**Development, Implementation, and Evaluation of a Pre-Matriculation Orientation**

Laurel A. Sampognaro, The University of Louisiana at Monroe, Roxie L. Stewart, The University of Louisiana at Monroe.

**Objective:** Describe and evaluate a newly implemented summer orientation designed to help students succeed during their first professional year. **Methods:** To better equip students for their first year of pharmacy school, the College developed a two-day June orientation. First, students were given a voluntary IRB approved pre-survey assessing confidence in knowledge of specific content areas including anatomy and physiology, basic math skills, algebra, and biochemistry/organic chemistry. Three assessments covering these subjects were given to measure baseline knowledge. First-year instructors communicated expectations of the students including topic lists they should have mastered during prerequisite coursework and provided the students with resources to use over the summer as self-study tools to enhance and/or refresh this information. Evidence-based study strategies were also presented. At Boot Camp in August, students were given the post-survey and assessments. Non-identifiable, student chosen codes were used on all survey and assessment tools for pairing. IBM SPSS Statistics, Version 25 was used to perform paired t-tests and descriptive analysis. **Results:** 74 students (88.10%) completed all surveys and assessments. On the post-survey, students reported significant increased confidence in background knowledge of algebra (p=0.001) and study skills (p=0.008). There was a significant improvement of assessment scores covering calculations (p=0.000) and chemistry (p=0.033). Students agreed/strongly agreed that the information provided in the orientation helped them feel more prepared in: basic math skills (72.2%), algebra (65.3%), anatomy and physiology (54.1%), organic chemistry (34.7%), biochemistry (36.2%), and study skills (83.3%). **Conclusions:** Overall, this orientation was a success and results of this study will be used for programmatic improvement. Data will be used in combination with first year progression data to help analyze student success. Other schools can benefit from implementing a similar program.

**Mapping the Co-Curriculum to C.A.P.E. Outcomes and ACPE Standards 3 and 4**

Tiffany-Jade M. Kreys, California Northstate University, Eugene D. Kreys, California Northstate University, Ashim Malhotra, California Northstate University.

**Objective:** ACPE requires students to participate in co-curricular activities that allow them to apply and refine skills learned in the classroom. To meet this requirement, CNUCOP developed, implemented, and mapped co-curricular learning outcomes (CoCuLOs) to six areas of the C.A.P.E domains and ACPE Standards 3 and 4. **Methods:** CNUCOP’s co-curriculum encompasses the following learning outcomes: CoCuLO1. Social Awareness/Cultural Sensitivity, CoCuLO2. Professionalism/Advocacy, CoCuLO3. Self-Awareness/Learning, CoCuLO4. Innovation/Entrepreneurship, CoCuLO5. Public Health/Education, and CoCuLO6. Service/Leadership. P1 to P3 students are required to participate in 2-3 CoCuLO events each year, with each of the 6 CoCuLOs being fulfilled by the end of the P3 year. Upon completion of an event, a self-reflection detailing how the event satisfied a specific CoCuLO is submitted by the student. Advisors use a rubric to evaluate the self-reflection to determine the students’ level of proficiency in the selected CoCuLO. The aggregated data from the CoCuLO evaluations were mapped to programmatic learning outcomes. **Results:** For AY 2018 to 2019, 223 students completed CoCuLO1 across 42 events, 212 students completed CoCuLO2 across 41 events, 311 students completed CoCuLO3 across 33 events, 228 students completed CoCuLO4 across 12 events, 218 students...
completed CoCuLO5 across 47 events, and 236 students completed CoCuLO6 across 31 events. On average, self-reflections for CoCuLO4 and CoCuLO5 received the highest rubric scores, while those for CoCuLO2 received the lowest rubric scores; no significant difference in scores occurred. **Conclusions**: The novel approach used by CNUCOP to assess the co-curriculum provides a mapping tool to easily gauge the student’s level of proficiency in each of the six CoCuLOs and enables the advisor to track the student’s progress in fulfilling the CoCuLOs.

**Measurement of Near Peer Mentorship and Hidden Curriculum: A Validity Study of a Novel Survey**


**Objective**: A growing body of literature suggests that factors beyond the curriculum influence student success and wellbeing in the health professions, including near peer mentorship and the hidden curriculum. Previous studies have linked these two concepts, but to date no instrument has been developed to measure these constructs. The objective of this study is to develop validity evidence for a novel survey instrument measuring near peer mentorship and the hidden curriculum by testing and reporting construct validity. **Methods**: A literature review and expert panel feedback were used in instrument development to create a pool of 40 questions. The questionnaire was then tested on a convenience sample of student pharmacists to examine validity and reliability using exploratory factor analysis with a varimax rotation. Eigenvalues $\geq 1$ were used to detect potential factors, and factor loadings below 0.3 were excluded. **Results**: From the 40 original questionnaire items, the instrument was reduced to 15 variables based on factor loadings. Three factors were identified: 1) Study support resources 2) Perceived preparedness for upcoming semester 3) Near peer mentorship. **Conclusions**: Exploratory factor analysis was used to develop a 15-item questionnaire with initial construct validity. The instrument should be further validated in a larger sample with confirmatory factor analysis.

**Measurement of Well-Being for Faculty and Staff Within a College of Pharmacy**


**Objective**: To measure the well-being of faculty and staff within the College of Pharmacy and Allied Health Professions. **Methods**: As part of the design process of a wellness plan, college personnel designed a survey to obtain baseline assessment of the overall well-being of faculty and staff. The survey asked a variety of quantitative and qualitative questions and was sent via email to all faculty and staff. A portion of the quantitative questions measured the degree to which faculty and staff agreed with a series of statements (7-point Likert scale). A chi-square test was used to evaluate differences between the number who selected an agree-based response versus non-agree amongst staff and faculty and then amongst associated ranks (eg, assistant versus associate professor). **Results**: The response rate was relatively strong overall (staff – 75%, faculty - 77%). In the comparison between faculty and staff, only one of the thirteen questions analyzed were statistically significant. When asked “Do you put too much pressure on yourself?” 93% of faculty answered yes versus 67% of staff (P-Value 0.0358). When comparing faculty amongst different ranks, of the thirteen questions analyzed, there was a significant difference in the number of professors who reported getting less sleep compared to that of non-professors (assistant or associate professors) (P-Value 0.0187). In addition, there was a significant difference in how many professors answered yes to the statement “Does work put too much pressure on you?” compared to non-professors (P-Value 0.0228). **Conclusions**: The results of this baseline survey will help the College, specifically the faculty development committee, tailor programs directed toward overall well-being of faculty and staff.

**Observing Gradual and Exciting Diversification in PharmD Post-Graduation Primary Employment**


**Objective**: To identify and analyze the trends in primary employment for Doctor of Pharmacy (PharmD) students following graduation. **Methods**: We utilized publicly available data from 2016 to 2019 in the American Association of Colleges of Pharmacy (AACP) Curriculum Quality Survey of Graduating Students. Graduating PharmD students were asked to indicate “current plans for primary employment upon your graduation from their college/school of pharmacy.” Respondents were able to select multiple primary employment plans. **Results**: The total number of respondents ranged from 10,926 to 11,407 during the 4-year period; response rates ranged from 75%-78% based on the annual total number of PharmD graduates. We observed a one-third decline over the period in the proportion of graduates reporting chain pharmacy for primary employment (-10.7%, from 37.3% of respondents in 2016 to 26.7% in 2019). Reported primary
employment increased in all other areas over the period; 2% in each category of hospital pharmacy, independent community pharmacy, and clinic-based practice; 1% increases in consultant, nursing home/long-term care, pharmaceutical industry, and managed care; and <1% increases in other areas. Net increase in hospital jobs actually equaled the decrease in community (+1044 and -1069, respectively). In addition, the number of respondents indicating plans for more than one employment opportunity increased by almost half, from 60% in 2016 to 88% in 2019. Conclusions: Further investigation is needed to determine if PharmD graduates are working more than one job due to large student loan debt burdens. The number of graduates entering community pharmacy is rapidly declining, and whether by choice or availability, graduates are seeking multiple and diverse employment opportunities. This may help to expand the influence of pharmacists within the healthcare arena and beyond.

PharmAlliance: One International Model for Collaboration
Caroline W. Sasser, David R. Steeb, University of North Carolina at Chapel Hill, Marian T. Costelloe, Monash University, Michael R. Munday.
Objective: To assess the impact of an international partnership between three pharmacy schools in areas of research, teaching, pharmacy practice, and student involvement. Methods: PharmAlliance is a partnership between UNC Eshelman School of Pharmacy, Monash University Faculty of Pharmacy and Pharmaceutical Sciences, and University College London School of Pharmacy. Impact was assessed through an institution-wide engagement survey taken in 2018 and through audit of grant funding, research collaborations and publications, development of joint course materials, and student collaboration and exchange opportunities. Results: Roughly two-thirds of faculty respondents engaged with PharmAlliance at some level. To date, over $1 million USD in funding has been invested in research grants and over $1.3 million USD has been obtained in extramural funding. The partnership has funded 35 joint grants to generate preliminary data. Most commonly, grant teams consisted of members from all three schools or between UNC and Monash. Grants falling within the “Research Domain” were funded most frequently, followed by those in the “Education Domain”. To date, 52 manuscripts have been published in peer-reviewed journals. Partners have developed 3 online modules, teaching communication methods, cultural competency, use of specific laboratory equipment. Additionally, partners have developed and delivered a distance-based student leadership course.

Over 100 professional and graduate students have participated in an exchange to one of the partner schools. Professional students have created a co-curricular organization to work on projects and initiatives across all three student bodies. Conclusions: The PharmAlliance partnership model is one example of international collaboration between three schools of pharmacy. Faculty members and students have been successful in collaborations by achieving internal and external funding support, designing educational interventions collectively, and collaborating for professional development.

Quality of Undergraduate Education and Its Relationship to the Didactic Performance in a Pharm.D. Program
Richard C. Beuttler, Chapman University, Siu-Fun Wong, Chapman University, Khaled Elsaid, Chapman University.
Objective: Pharm.D. programs seek to admit the most qualified candidates, with requirements including minimum GPA, PCAT scores, and recommendation letters among others. However, GPAs are not comparable across different universities and majors. The aim of this study was to assess if the rigor of the undergraduate education predicted academic success in a Pharm.D. program.
Methods: Undergraduate and pharmacy school academic records were reviewed on 359 student pharmacists in four cohorts within a Pharm.D. program. Undergraduate rigor was defined by the type of degree earned and if the school was a top-ranked university according to the 2020 U.S. News & World Report’s rankings. The program utilizes a composite exam as its primary assessment mechanism of the didactic phase and these exams are administered five times each trimester. The cumulative composite exam performance at midpoint and at completion of didactic curriculum defined academic performance. Regression models using combinations of undergraduate GPAs, PCAT scores, and undergraduate rigor to predict academic performance were compared. Results: Students who graduated from top universities had higher midpoint and final cumulative composite exam scores (80.03 vs 77.11, p<0.002 and 79.20 vs 76.08, p=0.002, respectively). Using the PCAT plus GPA, neither the type of undergraduate degree nor school ranking improved predictions. Using only GPA scores, adding school ranking significantly improved predictions of midpoint and final exam scores (adjusted R-squared of 0.15 to 0.18, p<0.001, and R-squared of 0.16 to 0.19, p<0.001, respectively). Conclusions: In the absence of independent standardized tests, school ranking in combination with undergraduate GPA may add value to the admissions selection based on its predictability for students to achieve academic success in pharmacy education.
The Development and Implementation of a Professional Career Development Program for PharmD Students
Tiffany-Jade M. Kreys, California Northstate University, Jonathan Ballard, California Northstate University, Ashim Malhotra, California Northstate University.

Objective: In response to the competitive climate of today’s job market for PharmD graduates, the Professional Career Development Series (PCDS) was designed and implemented by our college to incorporate a longitudinal component of professional development alongside the curriculum. The goal of the PCDS is to assist students in identifying professional career goals and provide the support needed to successfully fulfill these goals.

Methods: During the fall of its inaugural year, the PCDS consisted of an initial series of lectures delivered to all P1-P3 students, which covered topics including: 1. creating an electronic portfolio, 2. resume/CV-writing, 3. cover letter/letter of intent/thank you letter writing, 4. networking, 5. branding, and 6. professionalism. Related assignments were reviewed by advisors and uploaded into the student’s electronic portfolio, if appropriate. During the spring, once monthly seminars were provided, where P1-P3 students learned about specialty pharmacy career pathways taken by influential external speakers. For P4 students, postgraduate training preparation was delivered, along with CV/resume reviews by faculty. A Pharmacy Internship Fair and Graduate Interview Day is also provided annually as part of the PCDS to assist our students in obtaining internship and pharmacist positions. Results: CNUCOP plans to administer an end-of-the-year survey to further evaluate the effectiveness of the PCDS. Opportunities for improvement will be identified and feedback will be incorporated to further refine the PCDS programming. Conclusions: CNUCOP’s Professional Career Development Series provides a formalized approach to career development that spans across the four years of the program. As the PCDS continues to evolve, additionally topics pertinent to the pharmacy profession will be provided as students progress through the PharmD program.

Using Prerequisite Course Outcomes to Predict Academic Underperformance in Pharm.D. Students
Phyllis Stone, Long Island University, Jaclyn Novatt, Long Island University.

Objective: Our objective is to identify students who may need additional academic support during their first professional year of the Pharm.D. degree program. Our hypothesis is that students who repeated a required prerequisite course such as general chemistry, organic chemistry, or calculus will struggle more in the professional program, even if they ultimately attained a passing grade in that prerequisite course. To our knowledge, no relationship has been reported between repeating prerequisite courses and subsequent performance in the professional program. Methods: We compiled grade data from prerequisite and first professional year courses for students who entered the professional phase of our Pharm.D. program in Fall 2018 and Fall 2019. Students were grouped by how many times they needed to repeat specific prerequisite courses to obtain the grade required for admission to the Pharm.D. program. The data was analyzed using Analysis of Variance (ANOVA), in which the means were examined across the different groups. Results: We found statistically-significant differences in professional phase course performance between students who repeated certain prerequisite courses and those who performed well the first time. Differences were seen in students’ GPAs and performance in specific professional phase courses. Conclusions: We have found a metric that not only identifies which students may struggle in the professional phase of the Pharm.D. curriculum, but also seems to predict the specific courses in which they are likely to struggle. With this information, we will be able to preemptively target this subset of students with support services such as tutoring, peer mentors, and faculty mentors at the start of their first professional semester without needing to wait for the results of their first assessment.

Who's an Author? Giving and Getting Credit for Research
Mary E. Ray, The University of Iowa, Peter Swaan, University of Maryland, Lisa Lebovitz, University of Maryland, Carol Goldin, Rutgers, The State University of New Jersey, Peter N. Doshi, University of Maryland.

Objective: Determining the authorship of research publications is not always straightforward and can be the source of disputes over fairness. The International Committee of Medical Journal Editors (ICMJE) authorship criteria provide a framework for determining authorship, based on the specific contributions made by each researcher. The objective of this study was to determine whether, and how, ICMJE criteria are applied to publishing in schools of pharmacy at three research-intensive public universities. Methods: An online anonymous survey of pharmacy faculty, staff, graduate students, and postdoctoral fellows was conducted at Iowa, Maryland, and Rutgers to determine how ICMJE criteria were applied to their research and publishing efforts over the last five years. Responses could not be linked to identifiable individuals or institutions. Institutional Review Boards at all three universities granted exemptions for the research.
Results: Research participation was reported by 126 of 140 respondents. After reviewing ICMJE authorship criteria, 60/126 (47.6%) indicated that all named authors on research publications in which they were involved fulfilled all four ICMJE authorship criteria and 17/126 (13.5%) indicated that they were listed despite not meeting all criteria. Ten of 126 (8%) believed they had been denied authorship on a publication involving research in which they were involved. Conclusions: Around half of researchers are aware of authorship practices that do not conform to ICMJE authorship guidelines, and around 1 in 10 researchers report being denied authorship. These results prompt consideration of objective criteria for authorship recognition, greater recognition of these criteria, and ultimately a more responsible and predictable process to enable researchers to ensure that they are appropriately acknowledged in publications.

BIOLOGICAL SCIENCES

A High-Fidelity Cardiovascular Simulation for Enhancing the Integration of Pathophysiology and Pharmacology with Clinical Pharmacotherapeutics

Ashim Malhotra, California Northstate University, Zhuqiu Jin, California Northstate University, Song Oh, California Northstate University.

Objective: The integration of foundational sciences with clinical application remains difficult to achieve and measure. To bridge this gap, we designed, implemented and assessed an Integrated Cardiovascular Simulation (ICS), placing it in the Second Professional Year (P2) of our 4-year Pharm.D. curriculum. Methods: ICS employed Case-Based Learning principles and focused on congestive heart failure (CHF) with preexisting arrhythmias as comorbidity. A Laerdal SimMan 3G manikin was programmed to present CHF symptoms. P2 student teams were assessed on accurate identification of both symptoms and the underlying pathophysiology. ICS was staged through ER presentation (phase 1), admission to the ICU (phase 2), and hospital stay and discharge (phase 3). Laboratory values were integrated during phase 2, while the manikin presented atrial and ventricular fibrillation, Torsades de Pointes, and asystole, allowing students to learn rhythm identification. Additionally, students practiced the SBAR communication technique and patient counseling skills, and recommended therapy, elaborating MOA and adverse effects. ICS was assessed through pre- and post-session quizzes and perception data. Results: Respondents indicated that ICS helped them learn: 1) arrhythmia pathophysiology (85%), 2) EKG interpretation of arrhythmias (89%), 3) adverse effects of antiarrhythmic medications (93%), 4) clinical decision making (92%), and 5) communication skills between team members (85%). Ninety-one percent felt that ICS made the content more clinically relevant than lecture, while student perception of their interaction with the simulated patient was rated at 74%. Student performance improved on a post-test (80.2%) compared to the pre-test (66.9%), with an increase in symptom and arrhythmia pattern recognition (41.2% and 36.7% increase in the post-test). Conclusions: High-fidelity ICS is a novel tool to achieve and assess the integration of foundational and clinical knowledge.

Autophagy Induction by Alpha-Santalol in Human Prostate Cancer Cells

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Objective: The main objective of the study undertaken was to investigate the role of autophagy, regulated by the Akt/mTOR pathway, in alpha-santalol-induced prostate cancer cell death. Methods: Cell lines, LNCaP and PC-3 were maintained in an atmosphere of 95% air and 5% CO2 at 37°C. Trypan blue dye exclusion assay was employed to assess the effects of alpha-santalol and/or 3-MA (autophagy inhibitor) on the cell viability of prostate cancer cells. Acidic vesicular organelles (marker of autophagy) induced by alpha-santalol treatment in prostate cancer cells were detected by Immunofluorescence method. Immunoblotting was performed to analyze expression of proteins involved in the Akt-mTOR pathway. Results: Exposure of LNCaP and PC-3 human prostate cancer cells to alpha-santalol resulted in features characteristic of autophagic response, including formation of acidic vesicular organelles, as well as the recruitment and cleavage of microtubule-associated protein 1 light chain 3 (LC3) to autophagosomes. Alpha-santalol treatment suppressed activating phosphorylations of Akt and mammalian target of rapamycin (mTOR), which are critical regulators of autophagic response. In addition, treatment of PC-3 cells with specific inhibitor of autophagy (3-methyladenine) attenuated the expression of LC3-II, phospho-Akt and also significantly reduced the cell viability. Conclusions: Alpha-santalol induces autophagy by targeting Akt/mTOR pathway in prostate cancer cells, which may serve as a cytoprotective mechanism. Administration of known inhibitors of autophagy along with alpha-santalol results in increased cell death.

Cardiovascular and Digestive Self-care Trends Among US Adults: Results from a National Survey

Otito F. Iwuchukwu, Fairleigh Dickinson University, Elif Ozdener-Poyraz, Fairleigh Dickinson University, Anastasia M. Rivkin, Fairleigh Dickinson University.
Objective: To characterize the national prevalence of aspirin and probiotics use, evaluate personal and demographic factors associated with use, and identify opportunities for patient education. Methods: Survey research was based on telephone interviews with a randomly selected and nationally representative sample of US adults aged 18 and older (N = 1000) with a ± 3.9% margin of error. We analyzed overall prevalence of aspirin and probiotic use and examined factors associated with their use; additionally, we evaluated utilization of pharmacists for self-care product selection. Bivariate and logistic regression were conducted using SPSS (IBM Corp) with p values < .05 considered statistically significant. Results: Questions concerning aspirin usage showed 24% of adults nationwide are taking or have taken baby aspirin daily; 19% of whom did not consult a health professional about daily aspirin use. Over half of survey respondents (56%) take aspirin for primary prevention. There was a positive correlation between aspirin use and chronic illness, having health insurance, age, and identifying as white (p < .05). Questions concerning probiotic usage found 31% of adults are taking or have taken daily probiotics in food or pill form; 64% indicated use without consultation. There was a positive correlation between probiotic use, female, age and identifying as white race (p < .05). Approximately half of survey respondents (44%) rarely or never speak to a pharmacist; of those who do, only 10% seek self-care counseling services. Conclusions: A quarter of US adults use baby aspirin and one-third use probiotics; older white patients are more likely to use these products. Our survey found many patients take these without medical advice thus, there is an opportunity for pharmacists to counsel patients on appropriate use.

Connecting Antibody Structure and Function to Pharmacy Practice Through A Point-Of-Care Testing Lab
Sarah Collier, Lipscomb University, Sarah Uroza, Lipscomb University, Melinda McCormac, Lipscomb University, Joseph E. Deweese, Lipscomb University, Wendell S. Akers, Lipscomb University.

Objective: To design a laboratory exercise for first-year student pharmacists that leverages point-of-care (POC) and over-the-counter (OTC) tests used in practice to integrate pharmaceutical science concepts in immunology, infectious disease/microbiology, transfusion, and reproductive physiology. Methods: First-year student pharmacists (n=77) in the integrated biomedical sciences (IBS) laboratory course participated in groups of approximately four students each to conduct an exercise focusing on antibody structure and function in three common antibody-based clinical tests: voluntary determination of their own blood type (ABO+Rh) via agglutination as well as urine hCG pregnancy tests and Strep tests on mock patient specimens relative to controls. Student assessment was captured in a group-generated laboratory report. Results: Over three days, the first-year cohort successfully participated in an organized laboratory exercise that demonstrated antibody structure and function in action through common POC and OTC tests. Each student had the opportunity to identify their own blood type via Eldoncard analysis and compare the overall course summary results with national data. Mock patient specimens and case scenarios were developed for groups to analyze using home urine-based pregnancy and Group A Streptococcal diagnostic tests. Student groups were required to synthesize patient-friendly explanations of the science behind each test and apply their understanding in the proposed development of an antibody-based diagnostic test for Lyme disease. Conclusions: The model of community pharmacy is changing from a product-based business to a service-based business, many pharmacies are expanding into POC testing. As more and more pharmacists are providing POC testing it is important that pharmacists understand the science behind the tests. The ability to interpret results, identify common reasons for inaccurate readings, and counseling patients on the results are going to be increasingly important in the training of pharmacists.

Design of a First Year Integrated Pharmacy Laboratory
Teresa M. Seefeldt, South Dakota State University, Britney A. Meyer, South Dakota State University, Hemachand Tummala, South Dakota State University.

Objective: To describe the design of a laboratory course for first year pharmacy students focused on applied curricular integration. Methods: During a recent curriculum revision, integration of content across the curriculum was improved through design of an integrated pharmacy laboratory sequence. The first year integrated laboratory was taught starting in spring 2019. Two lab sections of 40-42 students each met weekly for 2 hours. The course integrated concepts from all of the first year discipline-specific pharmaceutical sciences and pharmacy practice courses. A variety of instructional methods were utilized, including case studies, simulations, educational gaming, and nonsterile compounding. The laboratory activities were delivered as either single activity sessions or stations that students rotated through. Randomly assigned small groups of six were maintained throughout the semester. A survey administered to students at the end of the semester gathered feedback on course effectiveness and design. Results: The survey response rate was 88% (72/82). Most respondents (96%) strongly agreed or agreed that the laboratory successfully integrated content from first year courses. Students were
asked open-ended questions to gather feedback on aspects of laboratory design that improved learning and how the laboratory could be improved. The most frequently mentioned design aspects that improved learning were the focus on application (n=22), self-directed learning (n=19), and small group work (n=13). More students preferred station-based activities compared to single activity sessions because of content variety. Allowing sufficient time to complete lab activities was the most commonly cited area for improvement (n=20). **Conclusions:** The first year of the integrated laboratory sequence was successfully implemented. The feedback from students was utilized to make changes for spring 2020, including additional time for activities and increased use of simulation.

**Determining the Extra-Cox Acetylation Targets of Aspirin**

Lloyd F. Alfonso, D’Youville College, Jayarama Gunaje, South Dakota State University.

**Objective:** To determine and identify cellular acetylation targets of aspirin other than cyclooxygenases **Methods:** Cells from different cell lines were left untreated or treated for 8h with different concentrations of aspirin from 0.25mM to 5 mM. Proteins were run on an 8% SDS-PAGE and immunoblotted with anti-acetyl lysine antibody. Moreover, anti-acetyl p53 antibody was also used to determine if aspirin was able to acetylate p53. The cell lysates were also immunoprecipitated using anti-acetyl lysine antibody conjugated agarose. The immunoprecipitation (IP) resin was washed, the bound proteins were eluted, reduced, alkylated, and digested. The peptide digests were subjected to LC-MS/MS analysis to identify peptide sequence matches. **Results:** Aspirin was able to acetylate multiple proteins in a time-dependent and dose-dependent fashion in several different cell lines. More importantly aspirin acetylated the tumor suppressor protein p53 (Lys 382) in a dose (1-5mM) and time (4-24 hours) dependent manner. Aspirin also appeared to stabilize p53 levels when used in the concentration range of 1.25-2.5mM. 33 other cellular proteins were also found to be acetylated by aspirin after enrichment with an anti-acetyl lysine antibody and subsequent analysis by mass spectrometry. **Conclusions:** These results show that aspirin is able to acetylate multiple proteins other than cyclooxygenases and it also acetylates and stabilizes the tumor suppressor protein p53. This could have significant implications in chemotherapy.

**Effects of Parkinson’s Disease Mutant VPS35 on Autophagy**

Katerina Venderova, Keck Graduate Institute, Jennifer Ito, University of the Pacific, Radek Linhart, Keck Graduate Institute, Adrienne D Desens, Phuong-Lan Nguyen, Keck Graduate Institute, Brian Ho, University of the Pacific, John Conty, University of the Pacific, Brandon Tran, University of the Pacific, Sandra Le, University of the Pacific.

**Objective:** Due to an insufficient understanding of the pathogenic mechanisms, no treatment can slow down the progressive neuronal loss in Parkinson’s disease (PD). Vacuolar protein sorting 35 (VPS35) is an autosomal dominant causative gene of PD. It is a key component of the retromer complex required for protein sorting and trafficking. The pathogenic mutation of VPS35 impairs its interaction with WASH complex but the mechanism of cell death is unknown. Based on our previous work, we hypothesized that VPS35 and WASH regulate autophagy and that the PD mutant VPS35 may cause neuronal death by impairing this essential cellular process. **Methods:** We utilized transgenic Drosophila lines that were either generated by us or obtained from Bloomington Drosophila Stock Center at Indiana University. To assess the locomotor activity, we expressed the transgenes in dopaminergic neurons and used a standard negative geotaxis assay (Linhart et al, Mol Neurodeg 2014). To test for genetic interactions, we activated autophagy by over-expressing Atg1 in the eye which causes a strong eye phenotype. We then tested for a potential modifying effect of genes of interest by analyzing the eye phenotype under a stereomicroscope. **Results:** Here we show that, consistently with PD in humans, expressing the pathogenic variant of Vps35 causes severe locomotor deficits and shortened survival. We next tested our hypothesis that Vps35 is involved in autophagy. Knocking down expression of Vps35, or reducing expression of WASH1, suppressed Atg1-activated autophagy. Overexpression of WASH1 or Vps35 (wild-type), but not mutant Vps35, stimulates autophagy, and this effect is dependent on a key autophagy protein, Atg9. **Conclusions:** Our data suggest that Vps35 (wild-type) stimulates autophagy and that the pathogenic mutant form of VPS35 causes PD by a dominant negative mechanism.

**Emerging Clinical Concept: Evaluation of Gedunin as a Possible Therapeutic Compound in Glioblastoma Treatment**

Michael Stouffer, Cedarville University, Elizabeth Wandling, Cedarville University, Lindsay Noland, Cedarville University, Denise Jean-Louis, Cedarville University, Samson Amos, Cedarville University.

**Objective:** Glioblastoma is an aggressive primary brain tumor. Current treatment regimens against glioblastoma include radiotherapy with temozolomide as an adjunct therapy. However, even with these multimodal therapeutic interventions, patients with glioblastoma have a
very low prognosis due to its invasive and refractory nature. There is a critical need for the development of new drugs and treatment modalities that will significantly increase patient survival and improve the poor prognosis of the disease. Gedunin, originally isolated from the neem tree (Azadirachta indica), has been shown to have potential in vitro antineoplastic properties; however, its effect on malignant brain tumor cells is unknown. This study analyses the potential anticancer activity of gedunin in glioblastoma cells and normal human astrocytes.

**Methods:** The antiproliferative effects of gedunin were evaluated using U87 and U251 glioma cell lines in the 3-[4,5-dimethylthiazole-2-yl]-2,5-diphenyltetrazolium bromide (MTT) and lactate dehydrogenase (LDH) assays. Additionally, the key molecular signaling targets that are perturbed in response to gedunin were examined using a phospho array kit and Western blot analyses to identify genes and molecular pathways that underlie the mechanism of gedunin action.

**Results:** Treatment of glioma cell lines with gedunin produced a concentration- and time-dependent decrease in cellular proliferation ($P < 0.05$). The data also showed a concentration-dependent increase in the amount of LDH released from the cells. Western blot analyses showed that treatment with gedunin down-regulated the expression levels of mTOR/Akt/NF-kappa B. In addition, gedunin treatment induced apoptosis through Poly (ADP-ribose) polymerase (PARP) and caspase activation.

**Conclusions:** In conclusion, gedunin decreases glioblastoma invasive growth by abrogating the Akt/NF-kappa B signaling pathway.

**Impact of a Pilot Growth Mindset Study on Entry-Level (PY1) Fairleigh Dickinson University Pharmacy Students.**

Otito F. Iwuchukwu, Fairleigh Dickinson University, Georgeta Vaidean, Fairleigh Dickinson University.

**Objective:** The ways in which students think about learning, intelligence, and self-abilities (mindsets) can have effect on learning progress and academic improvement. Mindset trainings have been shown to improve student performance. The Growth Mindset for College Students (GMCS) is an online mindset training activity designed to teach students to think with a growth mindset. We evaluated the impact of the GMCS activity on students’ levels of growth mindset for incoming 2019 PY1 students at FDU.

**Methods:** The Growth Mindset Activity was administered over a 2-week time frame. Students were randomly selected and presented with scientifically validated growth mindset questions either prior (“The Before group”) or post (“The After Group”) the growth mindset activity. Simple linear regression using a fixed effect with random assignments to test groups and no other covariates was used to compare effects between the Before and After groups. P-values < 0.05 were considered statistically significant.

**Results:** Of the 74 students from Fairleigh Dickinson University who participated in the study, 71% in the After Group ($n = 38$) reported thinking with a growth mindset, compared with 39% of students in the Before Group ($n = 36$); a 32% positive point change. The positive impact of the GMCS activity on our student cohort was statistically significant (Before group $M = 3.78$, After group $M = 4.68$ points on a 6-point
Impact of Integrated Teaching of Arrhythmias on Students’ Knowledge, Confidence and Perception on Pharmacist’s Role
Marina Galvez Peralta, West Virginia University, Kazuhiko Kido, West Virginia University.

Objective: To assess the effect of educational interventions on students’ knowledge, confidence, and perception on the role of the pharmacist as arrhythmia expert and part of a code blue team member. Methods: Four sessions were designed: Introduction of the crash cart during teaching antiarrhythmics pharmacology; a code blue simulation and debrief; patient cases; and ECG, pharmacology and therapeutics of arrhythmias. Assessment of the students’ knowledge, confidence and perception were performed with a 5-scale Likert-pre-post intervention survey. In addition, percentage of students that successfully addressed multiple-choice or fill-the-blank exam questions in these topics were collected anonymously. This project was IRB-approved. Results: The participation survey was 38% (31 out of 81 students enrolled in cardiology course). Survey results revealed an improvement on students’ knowledge and perceptions (p<0.001) in all aspects of the study. Students’ median answers increased from non-confident to moderately or very confident. Post-intervention shows that students were most confident on following ACLS AHA cardiac arrest algorithm, and less confident on discussing pharmacology of drugs involved in vFib. These observations were reflected on students’ performance during the exam, which contained 30 questions on these topics. 70-100% of students answered correctly exam questions, except one question related to comparison of calcium gluconate vs calcium chloride. Conclusions: This educational intervention will help students to acquire not only knowledge but also acknowledge the role of PharmD in a multidisciplinary code blue team. They are also a tool for instructors in science and clinical fields to reinforce discipline integration.

Inhibition of Major Human Cytochrome P450 Enzyme Activities by two Novel Carbonic Anhydrase Inhibitors
Van Nguyen, Michael Espiritu, Pacific University Oregon, Fawzy A. Elbarbry, Pacific University Oregon.

Objective: Both 9-a (sulphonamide derivative) and WES-1 (coumarin derivative) were designed and synthesized as potential selective Carbonic Anhydrase Inhibitors, and are currently being tested for anti-cancer activity. This study was undertaken to investigate their potential inhibitory effects on the major Cytochrome P450 (CYP) drug metabolizing enzymes in human liver microsomes Methods: The inhibitory potential of these compounds was tested using specific probe substrates for the examined CYP enzymes and the metabolites were detected by a cocktail liquid chromatography-tandem mass spectrometry (LC-MS/MS) technique that was developed in our laboratory. Results: 9a potently inhibited CYP2E1-catalyzed chlorzoxazone-6'-hydrolylation and CYP2C9-catalyzed tolbutamide-4’-hydrolylation with IC50 values of 0.05 and 0.7 µM, respectively. CYP2A6-catalyzed coumarin-7’-hydroxylation and CYP3A4-catalyzed testosterone-6b-hydroxylation were moderately inhibited by 9-a with IC50 values of 2.7 and 12 µM, respectively. The rest of the tested CYP enzymes were weakly or negligibly inhibited by 9-a. WES-1, on the other hand, demonstrated weak inhibitory effects on CYP2C19-mediated [S]-mephenytoin-4’-hydrolylation, CYP2C9 activity, and CYP2D6-catalyzed Dextromethorphan dealkylation with IC50 values of 39, 42.5, and 57.5 µM, respectively. Conclusions: This in-vitro data indicates that more in-vivo studies should be conducted to examine the potential pharmacokinetic drug-drug interactions with 9-a due to its potent and moderate inhibition of CYP2A6, CYP2C9, CYP2E1, and CYP3A4.

One for Fifteen
Ahmad Hanif, West Virginia University, Marina Galvez Peralta, West Virginia University.

Objective: To identify a method that would improve PharmD students’ attention and focus during class time Methods: We implemented “1-min Break” which consists of trivia questions of topics either related or unrelated to the content of the lecture. The break is scheduled every 15 minutes and lasts for less than one minute during which students are encouraged to participate. At the end of each course, an IRB-approved anonymous survey was offered to all P1, P2 and P3 PharmD students. The survey consisted of 5 Likert scale and open-ended questions which were used for qualitative analysis Results: The participation in the survey was 100% (155 students among P1, P2, and P3). All students cohort but one (154 students, 99.4%) liked this tool and thought it helped them refocus whenever they had become distracted in class. In addition, 58% of students preferred to have the breaks every 15 min. 63% preferred the topics of the breaks to be a combination of material-related and unrelated topics. When asked if other courses should also employ this tool, all students recommended having it in all courses across the curriculum. There were no differences
among students from different years (P1, P2 or P3). **Conclusions:** The 1-min Break could be a useful tool to help students stay focused during class time. It is simple, admired by students, has plenty of possible topics, and uses only a little class time. By investing 1 min of class time, we could win 15 min of students’ attention.

**Osteopontin Promotes Cardiac Fibrosis Via GRK2-mediated Impairment Of β2-Adrenergic Receptor Function**

Anastasios Lymeropoulos, **Nova Southeastern University**, Ava R Brill, **Nova Southeastern University**, Natalie Cora, **Nova Southeastern University**, Jennifer Ghandour, **Nova Southeastern University**, Victoria L Desimine, **Nova Southeastern University**, Celina M Pollard, **Nova Southeastern University**, Arianna Perez, **Nova Southeastern University**, Krysten E Ferraino, **Nova Southeastern University**, Shelby L Wertz, **Nova Southeastern University**.

**Objective:** Cardiac β2-adrenergic receptors (ARs) are known to inhibit collagen production and fibrosis in cardiac fibroblasts and myocytes. β2AR is a G protein-coupled receptor (GPCR) that stimulates generation of cyclic 3’, 5’-adenosine monophosphate (cAMP). cAMP inhibits cardiac fibroblast activation and fibrosis. Osteopontin (OPN) is a ubiquitous pro-inflammatory and profibrotic cytokine, including in the heart. We hypothesized here that aldosterone upregulates OPN in the heart in order to perturb β2AR’s anti-fibrotic function. **Methods:** We used the rat cardiomyoblast cell line H9c2 and human cardiac fibroblasts (HCFs). **Results:** Aldosterone upregulates OPN via the mineralocorticoid receptor (MR) in H9c2 cardiomyocytes. This is prevented by β2AR activation with salbutamol (albuterol), which stimulates GPCR-kinase (GRK)-5 to phosphorylate the cardiac MR and inhibit its transcriptional activity. Importantly, CRISPR/Cas9-mediated OPN gene deletion enhances β2AR-dependent cAMP generation in H9c2 cardiomyocytes. The functional result of this is that β2AR’s inhibition of transforming growth factor (TGF)β-dependent fibrosis in H9c2 cardiomyocytes is robustly augmented. In addition, pharmacological inhibition (with Cmpd101) of GRK2, the major GRK that phosphorylates and desensitizes the cardiac β2AR, or OPN CRISPR/Cas9-mediated knockout completely abrogates isoproterenol (agonist)-induced β2AR functional desensitization in HCFs (Isoproterenol’s ΔEC₅₀: 94 ± 16 μM in control HCFs, p < 0.05, n = 4; 6 ± 7.2 μM in Cmpd101-treated HCFs, Not significant at p = 0.05, n = 4; 5.3 ± 6.1 μM in OPN knockout HCFs, Not significant at p = 0.05, n = 4). Mechanistically, OPN forms a multi-protein complex with GRK2 and GRK2-interacting protein (GIT)-1 in HCFs, thereby facilitating GRK2’s plasma membrane recruitment to desensitize the β2AR. **Conclusions:** OPN inhibits cardiac β2AR’s anti-fibrotic signaling. Since aldosterone/MR upregulates OPN, a combination of an MR blocker with OPN or GRK2 blockade could be of value for cardiac fibrosis treatment.

**Refined Utilization of Powerpoint as a Teaching Tool Can Improve Student Performance on Exams.**

Melissa A. Burmeister, **William Carey University**, Jessica L Johnson, **William Carey University**.

**Objective:** There is ongoing debate regarding the effectiveness of PowerPoint technology on student learning and overall classroom dynamics in higher education. Here we tested the hypothesis that refinement and consolidation of PowerPoint slide content for an “Introduction to Human Physiology” course offered during the first term of an accelerated Doctor of Pharmacy program would improve student performance on exams. Specifically, application of this approach to what is, historically, an extremely content-laden course would grant more in-class discussion time and allow students to effectively navigate and prioritize content, master material and assay defeatist sentiments commonly expressed by students in post-course evaluations. **Methods:** In 2018, the total PowerPoint slide count provided to students was 1,990 (for 25 chapters). In 2019, content was refined such that the slide number was reduced by 51% (1,318 slides, for 23 chapters). In both renditions, four exams were administered using ExamSoft by the same professor. The students’ final letter grade for the course was determined according to a traditional 10-point grading scale. **Results:** In 2018, the grade distribution of the exam average was: A = 11; B = 16; C = 16; D = 8; F = 5; mean ± SEM = 77.90 ± 1.63; median = 78.80. In 2019, the grade distribution of the exam average was: A = 16; B = 21; C = 9; D = 4; F = 0; mean ± 84.70 ± 1.30; median = 85.00. These student outcomes data reflect, compared to the year prior, a significant increase in the exam mean (p < 0.05) and median, as well as an increase in the number of students attaining either an A or B in the course with a corresponding decrease in the number of course failures. **Conclusions:** These outcomes reflect the success of a scholarly approach to the classroom that leveraged literature, peer evaluation and student feedback to improve student learning.

**CHEMISTRY**

**Bridging the Gap: An Integrated Learning Exercise in Pulmonary Formulations**

Susan L. Mercer, **Lipscomb University**, Susan L. Mercer, **Lipscomb University**, Jessica Wallace, **Lipscomb University**,
Wendell S. Akers, Lipscomb University, Richard N. Dalby, University of Maryland.

**Objective:** Wixela™ Inhub™, the first generic dry powder inhaler (DPI) gained FDA approval in 2019 following delays attributed to establishing bioequivalence. Availability of this new DPI coupled with continued poor patient adherence to “Instructions for Use” for many inhalers prompted the design and implementation of an integrated pulmonary formulations laboratory experience for LUCOP P1 students (n=60). Pharmaceutical sciences and pharmacy practice faculty collaborated to design objectives intended to reinforce previously taught concepts in pulmonary physiology, particle size, bioequivalence and respiratory drug delivery, while introducing appropriate inhaler technique and patient considerations. **Methods:** Laboratory format (% grade) comprised a pre-lab quiz (10%), inhaler device research and group presentation (50%), bioequivalence activity (30%) and post-lab quiz (20%). Students researched and practiced technique with metered-dose inhalers (MDIs), Handihaler™, Ellipta™, Diskus™, Inhub™ and Respilock™ devices. **Results:** Students prepared a 10-minute presentation which (a) included medications available in their assigned device type, (b) described important components, (c) discussed API particle size and device characteristics that influence lung deposition, (d) described how patient characteristics impact device selection, and (e) demonstrated appropriate inhaler use while explaining the “why” behind technique steps. The pre- and post-lab quiz assessed the same content; average score increased from 56% to 72%, respectively. Lower performing students had a greater score improvement (13%), compared to the upper performing students (5%). **Conclusions:** Student competency associated with inhaled medication use increased after this integrated learning activity. Evaluations indicated that students enjoyed pulling together concepts from multiple courses and developing their ability to understand the scientific basis for common inhaler counseling points. Our hope is that the documented combination of enthusiasm and increased knowledge results in enhanced inhaler technique counseling after students enter practice.

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**Design, Synthesis, and Biological Evaluation of Novel Allosteric Protein Disulfide Isomerase Inhibitors**

Suhui Yang, American University of Health Sciences.

**Objective:** Protein disulfide isomerase (PDI) is responsible for nascent protein folding in the endoplasmic reticulum (ER) and is critical for treatment of glioblastoma multiforme (GBM). We previously identified a PDI inhibitor lead compound, BAP2, we designed and synthesized 67 analogues to improve the potency in this study. **Methods:** Total 67 new analogues were synthesized through different synthetic methods including base-catalyzed Claisen-Schmidt condensation reaction. These compounds tested for inhibitory effect against PDI reductase assay. 23 compounds with IC50 values lower than 1.5 μM against PDI tested for cytotoxicity in a panel of brain cancer cell lines. The analogues were used to see whether they induce ER stress and downregulate DNA damage response genes (through experiment and Bru-seq analysis), they inhibit GBM cell migration, and they bind to His256 in the β domain of PDI. **Results:** SAR analysis determined that PDI inhibition relied on the hydroxyl group of the chalcone scaffold (ring A) and cLogP increase in the sulfonamide chain improved potency. Docking studies revealed that BAP2 and analogues bind to His256 in the β domain of PDI, and mutation of His256 to Ala abolishes BAP2 analogue activity. Analogues inhibit glioblastoma cell growth, induce ER stress, increase expression of G2M checkpoint proteins, and reduce expression of DNA repair proteins. **Conclusions:** We identified five compounds that were more potent and cytotoxic than the lead BAP2, as well as compound that induced ER stress and inhibited GBM cell migration and MMP9 expression. Some analogues induced genes involved in the unfolded protein response (UPR) and decreased expression of E2F target genes, validating PDI inhibition in the cells. Their interaction in the β domain of PDI (allosteric site) seemed to play the most significant role.

**Development and Implementation of a Drug Discovery and Development Game**

Nicole A. Lounsbury, Larkin University, Nicholas K. Chow, Baptist Health South Florida, Kenneth M Jackson, Larkin University, Christiane Chbib, Larkin University.

**Objective:** To improve student understanding of the drug discovery and development process. **Methods:** An elective entitled “Non-traditional Pharmacy Career Routes” was offered to 17 P2 students. One section of the course was pre-clinical drug development and most of the course time was devoted to a game which was designed to mimic the drug discovery and development process. Students were split into groups, comprising of either big Pharma, start-up or generic companies. The amount of resources each group had depended on the type of company they were. Students worked within various disease states to develop and bring to market the most drugs and gain the most money. In order to reinforce the learning process, some “failure” cards were left blank, and before playing the game, students had to fill in reasons for failure during the process. **Results:** The students enjoyed playing the game and felt that it helped them to understand the process and what occurs. Groups employed different strategies,
mimicking the real-life process, which will be discussed further in the poster. The course offered a pre- and post-assessment, and of the 14 students who took both, an average of 78.6% students got the two questions on drug discovery and development on the pre-course assessment correct, while in the post-course assessment an average of 96.4% of students got the two questions correct. Conclusions: A novel game which allows students to role-play the drug discovery and development process was developed, which has the potential to be implemented in similar courses.

**Discovery of a Unique Rearranged Pyranomorphinan, UMB426: A New Pharmacophore**

Mohammad I. Ansari, Jason R. Healy, West Virginia University, Kellie Hom, University of Maryland School of Pharmacy, Jeffrey Deschamps, Naval Research Laboratory, Rae R. Matsumoto, University of the Pacific, Andrew Coop, University of Maryland.

**Objective:** The purpose of this research program was to develop efficacious analgesics lacking the side effects such as tolerance and respiratory depression associated with current prescription opioids; which resulted in the current opioid epidemic in the USA. In continuation of our effort towards the development of novel opioid analgesics, we developed UMB425, a μ agonist/δ antagonist and during the scale-up of UMB425, a unique rearranged product was uncovered on the treatment with boron tribromide (BBr3). We elucidated the structure with the help of 1D, 2D NMR, and the X-ray crystal structure.

**Methods:** To assign the structure of the rearranged product, we performed and monitored the reaction with various parameters: (1) Temperature-controlled reactions (2) Mass spectroscopy and 1D and 2D NMR spectroscopy (3) Screening of various Lewis acid for possible rearrangement (4) Development of X-ray crystal structure and, (5) In vitro binding studies

**Results:** We found that reaction was temperature-dependent and a slight variation (10°C) resulted in different product formation. Mass and NMR spectroscopic analysis revealed the possible expansion of 4,5-epoxy ring to dihydrobenzopyran with the insertion of a bromine atom on 7-position and finally, the X-ray crystal data confirmed the structure. After the screening of various Lewis acids, we found that only BBr3 was the most effective for this conversion. In-vitro data showed that UMB426 has a mixed profile of μ agonism/δ antagonism. **Conclusions:** The structure of the rearranged UMB426 was assigned and studied. Ring expansion is a more delicate change; it changes the conformation of the skeleton while retaining the hydrogen bond accepting oxygen bridge intact. The presence of α-bromine atom on 7-position opens the possibility of further modification using metal-catalyzed reactions to design and synthesize future analogs.

**Medicinal Chemistry Course Offerings by US Schools/ Colleges of Pharmacy**

Radhika Venkatraman Kumar, American University of Health Sciences, Suhui Yang, American University of Health Sciences, Arjun P. Dutta, American University of Health Sciences, Mohammed A. Islam, American University of Health Sciences.

**Objective:** To evaluate the implementation of medicinal chemistry as a standalone course in the PharmD curriculum across the pharmacy schools in USA. **Methods:** The websites of 144 ACPE accredited schools/ colleges of pharmacy were visited during October-December 2019. Information on medicinal chemistry course offerings including content, credit hours, and catalog descriptions were identified and retrieved. Data were extracted and analyzed by using a systematic content analysis method by two individuals. Microsoft Excel spreadsheet was used for data entry and analysis. **Results:** A total of seventy-three out of 144 schools/colleges (~51%) in the US offer medicinal chemistry in the PharmD curriculum as standalone course including introductory (~32%) and comprehensive (~21%) aspects respectively. Thirty out of 73 programs (~41%) offer extensive and in-depth medicinal chemistry standalone course accounting an average of 6.7 ± 3.4 semester credit hours. Data shows that the introductory medicinal chemistry course is offered as a foundation to integrated courses in 46 out of 73 programs (~63%). The content coverage includes drug classes, mechanism of action, structure-activity relationships related to organ systems and disease states Public schools offer two-third of comprehensive medicinal chemistry courses. Interestingly, medicinal chemistry elective courses account to < 8% PharmD programs. **Conclusions:** There is a variation in the depth and breadth of medicinal chemistry coverage in pharmacy curriculum. This study may be used as a benchmark to streamline the medicinal chemistry content across US pharmacy curricula.

**New Chemical Affinity Probe for Quantitative Proteomic Profiling of PI3Ks**

Xin Chen, Presbyterian College.

**Objective:** To develop a new chemical affinity probe that can be immobilized on Sepharose beads to capture PI3Ks, including the wild type and mutated forms, in cancer cells for quantitative proteomic profiling. **Methods:** 1) Rational drug design based on the co-crystal structure of NVP-BKM120 with PI3K to give the desired target BKM120 analog, which was further validated by computer docking. 2) Chemical synthesis to yield the target compound which was immobilized on ECH-Sepharose beads. 3) Affinity capture of the PI3Ks from cancer cell lysate with the immobilized PI3K inhibitor beads. 4) LC-MS/MS measurements and quantification of the captured PI3Ks

**Results:** The newly developed
PI3K chemical affinity probe was able to capture PI3Ks from various breast cancer cell lines and PDXs. Using this PI3K chemical affinity probe, two known PI3K inhibitors NVP-BKM120 and BYL719 exhibited PI3K inhibition in a dose-dependent manner in consistent with previous findings. Furthermore, the newly developed PI3K probe was able to capture the mutated PI3K H1047R. **Conclusions:** We have developed an new chemical affinity probe for the quantitative proteomic profiling of PI3Ks which was able to capture the wide type and mutated PI3Ks from cancer cells.

**Student Created Lightboard Video Lecture with Immediate Feedback Quiz to Reinforce Student Drug Action Learning**


**Objective:** To assess whether students have improved knowledge and perception of understanding of key concepts of drug action after participating in a learning module involving a student created lightboard summary video and an immediate feedback quiz. **Methods:** Following two in-class lectures for second year pharmacy students on antiarrhythmic drugs in a Principles of Drug Action course, one group (A) was given access to a learning module consisting of a summary lightboard video with embedded questions and an immediate feedback quiz for 2 days, and the other group (B) studied the lecture material as usual. A pre-post survey was conducted to assess the drug knowledge (ten questions) and student perception (twelve questions) in both the groups. All responses were recorded using a 4-point Likert scale and compared using Mann-Whitney U test. Statistical significance was determined at p<0.05. Six and eight additional questions assessing the learning module and effectiveness of the lightboard video were included in the post survey, respectively. Also, three additional open-ended question were included in the post-survey to capture the students’ reflections on the learning module. **Results:** For Group A, the pre-quiz mean score was 3.39 (median = 3.00, n=33) and the post-quiz mean score was 5.37 (median = 5.00, n=27), p<0.009. For Group B, the pre-quiz mean score was 2.88 (median = 3, n= 42) and the post-quiz mean score was 2.11 (median=2, n=28), p<0.047. Student perception of knowledge improved after the learning module on all questions (all p<0.05) in Group A but not in Group B. **Conclusions:** Student created summary lightboard video with an immediate feedback quiz may improve understanding of concepts of drug action compared to usual study methods.

**Thioamides and Dithiocarbamates as Potential PTP1B Inhibitors**

Ronny Priefer, *MCPHS University–Boston*, Tanvi Deshpande, *MCPHS University.*

**Objective:** Diabetes is a disease that affects 30.3 million Americans. Approximately 90-95% of these cases are Type II diabetes. It has been found that this disease is directly linked to an over activity of protein tyrosine phosphatase 1B (PTP1B), which dephosphorylates the multiple tyrosine residues within the insulin receptor (IR) protein. This dephosphorylation prevents insulin from binding to the receptor site, thus ultimately increasing the blood glucose levels. The purpose of the study is to evaluate both thioamide and thiocarbamate scaffolds for their PTP1B inhibitory activity. **Methods:** We conducted a screening of over 200 random simple organic compounds and compared the rates of dephosphorylation of para-nitrophenylphosphate with the known commercially available 1,2-naphthoquinone inhibitor following published protocols. Compounds with comparable rates of dephosphorylation were further examined to obtain IC50 values. Using tetramethylthiuram disulfide as a starting reagent, when reacted with an alkyl/aryl lithium, the product obtained is depended upon the temperature at which the reaction was performed. When done at room temperature, thioamides are preferentially formed, however, at -78oC, dithiocarbamates are the dominated product (ie, the kinetic product). **Results:** Three initial compounds displayed good activity towards PTP1B and thus became our "hit" starting point. These three compounds, tetramethylthiuram disulfide, dithiooxamide, and dithizone, each had a lower IC50 than the 1,2-naphthoquinone inhibitor. The structural similarity between the three is a thioamide/thiocarbamate moiety. Our synthesized compounds with ranging alkyl and aryl substitution displayed a variety of activity against PTP1B. **Conclusions:** We have synthesized a library of thioamides and dithiocarbamates based upon their structural similarity to tetramethylthiuram disulfide, dithiooxamide, and dithizone. We have obtained a diversity of activity correlated to the aryl and alkyl substitution that we have added onto the pharmacophore.

**CONTINUING PROFESSIONAL DEVELOPMENT**

**Burnout at a College of Pharmacy, College of Optometry, and School of Physician Assistant Studies**


**Objective:** Burnout is characterized by depersonalization, emotional exhaustion, and reduced personal accomplishment and is common among healthcare providers. However, there are limited studies evaluating burnout in health professions students and faculty. This
Do Student Pharmacists Possess the Strengths Necessary for Success in Emergency Cardiovascular Response?

Susan E. Smith, The University of Georgia, Andrea S. Newsome, The University of Georgia, Linda D. Logan, The University of Georgia, Michael J. Fulford, The University of Georgia.

Objective: To identify strengths important for response to cardiovascular emergencies and test the hypothesis that student pharmacists are frequently equipped with strengths deemed necessary for success. Methods: A cross-sectional electronic survey was distributed to clinical pharmacists with roles in emergency cardiovascular response to determine which CliftonStrengths® themes are considered important for: (1) members of a cardiovascular emergency response team, (2) a pharmacist’s role in advanced cardiovascular life support (ACLS), and (3) a team leader’s role in ACLS. Subsequently, Doctor of Pharmacy (PharmD) students’ top five and bottom five CliftonStrengths® themes were identified and were compared to those themes identified in the survey. Descriptive statistics were used to report findings. Results: The survey was completed by 397 clinical pharmacists, representing adult (88%) and pediatric (12%) patient populations and community (50%), and university-affiliated (40%) hospitals. Nearly all respondents (96%) had undergone certification in ACLS and/or pediatric advanced life support (PALS). Communication, adaptability,
analytical, and focus were among the top five strengths identified for a resuscitation team, a pharmacist, and a team leader. Command was additionally considered important for a resuscitation team and a team leader, whereas responsibility was considered important for pharmacists. Students’ top strengths were achiever, harmony, learner, consistency, and responsibility. Students’ bottom strengths were strategic, context, ideation, woo, command, and communication.

Conclusions: Doctor of Pharmacy students possess few of the strengths that clinical pharmacists consider important for emergency cardiovascular response. Future research should investigate methods of teaching ACLS to PharmD students in a way that supports their strengths and acknowledges their less developed themes.

Illuminating the Role of Oncology Pharmacists in Cancer Immunotherapy

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Objective: Immunotherapy as single agent therapy or in combination with other standard of care treatment modalities (radiotherapy, biotherapy, chemotherapy, etc) has exploded onto the oncology world with such ferocity that providers are struggling to keep abreast of the science and toxicities. Our group wanted to assess the “state of the union” for oncology pharmacists and determine what professional and educational gaps currently exist in the oncology pharmacy profession. Methods: Data was collected using an anonymous, comprehensive survey that was developed, validated, and deployed to academic and community cancer institutions around the country. The survey used qualitative and quantitative questions and was designed to assess the demographics of the oncology pharmacists, their continuing education about immunotherapy agents and toxicity management, their comfort with dispensing and caring for patients on immunotherapies, and their level of involvement in treatment and formulary selection. Results: There were variations between oncology pharmacists dependent on their area of focus (inpatient vs outpatient), with the greatest disparity between academic and community institutions. Though the full analysis of the results is pending, interesting subgroup variations were noted among the respondents and indicate that closing the educational void for oncology pharmacists will necessitate active assimilation into the continuing education requirements for oncology pharmacists. Conclusions: There are mechanisms available for oncology pharmacists to seek out education around cancer immunotherapy, but oncology pharmacists may not have awareness of the stark differences between biotherapy and immunotherapy. Though the National Comprehensive Cancer Network (NCCN) recently published guidelines around immunotherapy toxicity management, the uptake on these resources has been slow.

Interprofessional Education (IPE) Simulation Activity to Enhance Substance Use Education in Pharmacy and Nursing Students


Objective: In light of the opioid crisis in the US, simulation-enhanced interprofessional education (IPE) with a focus on substance use disorder is an opportunity for students to encounter a sample “patient case” in a structured, safe setting, while learning about the roles of other professions, enhancing clinical knowledge and communication skills. The main purpose of this research is to evaluate the effect of IPE on students’ attitudes toward interdisciplinary healthcare teams and working with individuals who are either at-risk-for or experiencing substance use disorders. The secondary goal is to provide students with structured experiential learning about the clinical presentation of a developing substance use disorder. Methods: New York University (NYU) Meyers College of Nursing and Long Island University (LIU) Pharmacy held two IPE events in Summer 2019 focused on learning about pain management, substance use disorders and opioid addiction (N = 150). The simulation consisted of two scenarios using a standardized patient with complex pain and addiction issues. A debriefing session was conducted thereafter to gain a richer understanding of the students’ perceptions of assessment, treatment planning, and working within interprofessional teams. Students’ attitudes toward IPE were measured using The Interprofessional Collaborative Competency Attainment Surveys (ICCAS) (1 = poor, 5 = excellent) pre- and post-simulation. IRB approvals were obtained. Results: Results of the ICCAS show significant improvements in students’ attitudes in all domains of the survey (communication, collaboration, roles/responsibilities, patient-centered care, team functioning), with means above 4 for all post-simulation scores indicating substantial progress, p < 0.001. Conclusions: The results support that the IPE events increased students’ understanding of the current opioid epidemic, assessment and planning care for a patient with a developing substance use problem, and importance of working in interprofessional teams.
Measures of Empathy, Burnout and Emotional Intelligence in Pharmacy Students: Time for a Change?

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Objective: Although burnout and loss of empathy has been thoroughly documented in physicians, residents and medical students, there is a paucity of data on these measures of well-being in pharmacy students. The purpose of this ongoing longitudinal study is to measure burnout, empathy and emotional intelligence longitudinally in Pharm D. students.

Methods: Three validated survey instruments were utilized, the Jefferson Scale of Empathy (JSE), the Maslach Burnout Inventory (MBI) and the Emotional and Social Competency Inventory (ESCI). The JSE is measure on a scale of 1-120; The MBI has three categories: Personal Accomplishment, Exhaustion and Cynicism. The ESCI measures 12 competencies on a 1 through 5 scale. These data represent program outcomes of the co-curriculum program, responses of students who disagreed will help improve co-curricular activities. These student responses can also be beneficial for other Colleges of Pharmacy who are still developing co-curricular programs.

Pharmacy Students’ Perceptions Towards Co-Curriculum Program Implemented in Their Professional Years

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Objective: To assess pharmacy students’ beliefs, attitudes, and intentions towards the co-curriculum program implemented in their professional years.

Methods: In this cross-sectional study, data were collected using a self-administered anonymous survey, approved by the University’s Institutional Review Board. Responses were measured on a 5-point Likert scale: Strongly Disagree-Strongly Agree. Study participants were the Class of 2021, beginning their third professional-year (P3) within the PharmD program. The survey was administered during a town hall meeting and lecture period. Students received a verbal review of the invitation letter for informed consent beforehand. IBM SPSS version 24.0 was used for data analyses. Frequencies, crosstabs, and regression analyses were utilized to achieve the study objectives.

Results: A total of 117 of 230 students completed the survey (67.5% females). Respondents had positive beliefs (M=3.48; SD=0.82) and favorable attitude towards (M=3.62; SD=0.63) co-curricular activities. 62% agreed-strongly agreed that co-curricular activities contributed to their professional and personal development. 54% agreed-strongly agreed co-curricular activities gave them a better idea of what pharmacy career path they would like to pursue. Respondents agreed-strongly agreed that co-curricular activities were interesting (50.4%) and informative (73.5%). However, students were unsure of their intentions to attend co-curricular activities (M=3.0; SD=1.01). Also, gender differences were observed among responses to each survey item. Overall, beliefs of the outcomes of attending co-curricular activities and attitude towards them were found to be significant predictors of respondents’ intentions to attend the activities (β=0.53 and 0.25, respectively, p<0.05).

Conclusions: While the majority agreed with the intended outcomes of the co-curriculum program, responses of students who disagreed will help improve co-curricular activities. These student responses can also be beneficial for other Colleges of Pharmacy who are still developing co-curricular programs.

The Impact of Co-Curricular Engagement on Doctor of Pharmacy Students’ Professional Development

Kathryn A. Schott, Drake University, Robyn Cooper, Drake University, Cheryl L. Clarke, Drake University, Michael H. Nelson, Drake University.

Objective: The purpose of this mixed-methods study was to explore how student pharmacists make meaning of their co-curricular engagement and to determine the extent to which their learning aligns with desired learning.
outcomes described in ACPE’s Standards 2016 Standard 4. **Methods:** ACPE Standard 4 was used as the conceptual framework. Participants were students in their third year of a four-year Doctor of Pharmacy program at one of four institutions. Students self-assessed using a Likert scale across eight variables that measured self-awareness, leadership, innovation/entrepreneurism, and professionalism. Each participant engaged in a 30-minute interview where they described their co-curricular engagement and its role in their development across the four domains of Standard 4. **Results:** Eight themes and three sub-themes emerged from the qualitative data gathered through the interviews, all of which aligned with two or more key elements within Standard 4. Descriptive statistics supported this alignment, with students agreeing (4) or strongly agreeing (5) that co-curricular activities supported their growth across the four key elements – self-awareness (M = 4.56), leadership (M = 4.76), innovation and entrepreneurship (M = 4.44), and professionalism (M = 4.54). Pearson’s correlation coefficient was significant among variables measuring the extent to which students attributed co-curricular engagement and their development in the areas of leadership (r = .502, p < .001), innovation and entrepreneurship (r = .404, p < .001), and professionalism (r = .399, p < .001). **Conclusions:** Collective qualitative and quantitative analysis demonstrated significant alignment between students’ perceived outcomes and those desired by ACPE. This study may have significant implications for pharmacy educators, administrators, educators relative to student professional development.

The Lunch Bunch- A Meaningful and Impactful Conversation on Leadership
Lea S. Eiland, Auburn University, Sylvia E. Rogers.

**Objective:** An article club was designed to foster leadership within our pharmacy school by informally gathering interested faculty and staff that provided a safe environment for discussion on leadership concepts. **Methods:** Participants discussed one of the Harvard Business Review’s Top 10 Leadership articles monthly. The faculty member who initiated the activity prepared 7-8 questions for discussion. After 10 sessions, participants were asked to complete an electronic questionnaire on their perspectives of the activities. Additionally, participants could volunteer for an interview. Descriptive statistics were calculated and qualitative software assisted in analyzing interview transcripts. No programmatic costs were incurred. Videoconferencing allowed off-campus employees to participate. **Results:** Four to 24 participants attended each session and 16 completed the questionnaire with five volunteering for interviews. Most participants were from the pharmacy practice department, female, and had been a faculty member for an average of 11 years. Five faculty also held administrative appointments. Participants attended on average five sessions. All 16 strongly agreed the sessions “increased awareness of leadership concepts” and 15 strongly agreed/agreed the activities “influenced my leadership decision-making” and “facilitated building a culture of leadership at the school.” Interviews reveal mid-career faculty participated to learn from discussions and some junior faculty participated to gain leadership skills to help with promotion. The most valuable activity was the discussion. Participants noted they were exposed to leadership styles they were previously unaware of and the article Discovering Your Authentic Leadership was favorited. Teaching and practice commitments were the two highest noted barriers to participating. **Conclusions:** Providing an interactive discussion forum to learn and discuss leadership concepts and qualities is effective for personal growth and professional development. Other schools can implement similar activities to foster leadership.

**EXPERIENTIAL EDUCATION**

A Gap Analysis: Interprofessional Clinical Instructor Professional Development to Support Student Interprofessional Educational Experiences
Amanda Margolis, University of Wisconsin-Madison, Sarah Jung, Anne Stahr, Paula Woywod.

**Objective:** To determine interprofessional clinical instructor professional development needs and preferences to support student interprofessional educational (IPE) experiences on rotation. **Methods:** A survey was administered electronically to medical, nursing, and pharmacy clinical instructors and preceptors. Questions included familiarity with Interprofessional Education Collaborative (IPEC) Core Competencies, frequency of meaningful interprofessional activities incorporated into clinical teaching, and formal assessment of student understanding of IPEC competencies. Preferences for access to training materials and IPE preceptor development topics were also asked. **Results:** Of the 431 respondents, 73 had a medical degree (16.9%), 195 had at least one nursing degree (45.2%), 135 had a pharmacy degree (31.3%), and 6.5% had other health profession degrees. Regarding the IPEC core competencies, 28.3% were familiar with interprofessional communication, 27.8% were familiar with teams and teamwork, 26.2% were familiar with roles and responsibilities, 19.7% were familiar with values and ethics, and 63.1% were not familiar with any core competencies. Current IPE practices included 37.6% respondents who incorporated meaningful
IPE activities at least five times per rotation and 54.5% who assessed student interprofessional IPEC competencies. There were 332 respondents (77%) who reported they were willing to participate in IPE professional development. Respondents preferred to access training as a web-based application (81.2%). IPE related preceptor development topics of interest included the IPEC core competencies, recognizing opportunities for teaching students from other professions, setting expectations, and self-directed learning for students. **Conclusions:** The interprofessional gap analysis revealed a need and interest among clinical teachers for IPE related professional development. This analysis supports an online interprofessional continuing professional development activity to introduce and support interprofessional clinical teaching for health sciences clinical instructors to better support students on rotation.

**A National Survey of Staffing, Responsibilities, and Challenges Within Pharmacy Experiential Education (EE) Programs**

Angela Brownfield, *University of Missouri-Kansas City*, Denise M. Klinker, McCreadie Group, Aaron O. Thomas, *University of Florida*.

**Objective:** This programmatic initiative was designed to: Disseminate information regarding staffing, responsibilities, and challenges within EE Produce an understanding of national trends regarding challenges within EE Provide information to support EE program management decisions

**Methods:** In 2018, the AACP EE Section Membership Committee was charged with collecting data to describe EE programs. A 36-question survey was developed by the 2018-19 committee and distributed to 142 experiential programs using Qualtrics. One leader at each experiential program received the survey. The survey was emailed in May 2019, with a reminder sent one month later, and closed in August of 2019. Both quantitative and qualitative data were reviewed both independently and collectively by the 2019-20 committee members in the fall of 2019. A formal report will be submitted to the EE Section Chair in June of 2020.

**Results:** One-hundred and eleven responses were collected (78% response rate) and stratified by the number of students/class as well as in aggregate. The faculty and staff FTE Means were 2.15 (SD=2.12) and 2.63 (SD = 1.54), respectively. An untapped resource in utilizing both paid and unpaid APPE students existed. Self-reports showed there was considerable overlap of responsibilities for faculty directors and staff coordinators who manage both operational and executive-level tasks. The most cited challenges for programs included: increasing number and complexity of on-boarding requirements and student issues and expanding responsibilities of the experiential team.

**Conclusions:** We have seen an increase in the total number of FTEs within experiential teams between 2011 and 2018, indicating improved support of experiential teams. However, experiential leadership continues to report challenges in obtaining and maintaining appropriate staffing levels to support current responsibilities.

**Assessing an Advanced Pharmacy Practice (APPE) Readiness Skills Lab Using Timed Stations and Gamification as Variables.**


**Objective:** To assess the effect on engagement, teamwork, and confidence of students as well as perception of students and faculty in an APPE readiness skills laboratory activity using time and gamification as variables. We hypothesized that gamification of the lab would improve the stated outcomes while decreasing negative perceptions of timed activities.

**Methods:** Students worked in teams to complete APPE readiness skills. Section one completed stations with no time limit and no game, section two included a time limit per station but no game, section three included time limits and was in the setting of an escape room game. Students were offered pre and post-lab surveys. Surveys were also offered to participating faculty.

**Results:** Using assigned definitions for engagement, 91.3% (n=23) of responding game section students reported an engagement level of 5 out of 5 vs. 72.72% (n=33) in the non-game sections. Similarly, 77.27% (n=22) of responding game section students vs. 50% (n=32) in the non-game sections rated their groups as 5 out of 5 on a Likert scale assessing teamwork. More negative perceptions were reported by students in the non-timed section than the timed sections. Using a paired t-test, student pre and post skill confidence levels were analyzed for all sections combined. There was a significant (p < .05) increase in confidence levels for one skill while four skills resulted in significant decreases in confidence. Faculty perception of the lab was overall positive.

**Conclusions:** Although students often report negative perceptions of timed lab activities, our results suggest that time limits improved the perception of this lab. The addition of a game increased student engagement and teamwork also resulting in an overall more positive perception by students and faculty.

**Assessing Pharmacy Students Burnout, Stress, Quality of Life, Empathy, and Tolerance for Ambiguity**

Jared Van Hooser, *University of Minnesota*, Stephanie Swanson, *University of Minnesota*, Jeannine M. Conway,
Objective: The primary objective of this survey was to determine a baseline measure of pharmacy student burnout, stress, quality of life, empathy and tolerance of ambiguity. Students from all four years of the curriculum were asked to participate on a voluntary basis. Methods: A survey including several assessment scales (Tolerance for ambiguity (TFA), Interpersonal reactivity index (IRI), Quality of life (QOL) scale, Perceived stress scale (PPS), and Oldenburg Burnout Inventory (OLBI)) was sent and responses collected via REDCap to pharmacy students within a standalone college of pharmacy. Data analysis was completed using JMP Pro 13. Descriptive statistics were completed in addition to comparing means based on gender (Student’s t-tests) and respondent’s year in the curriculum (Tukey’s HSD). Results: A total of 231 pharmacy students (n=32 first year, n=75 second year, n=58 third year, n=66 fourth year, 75% female) completed some or all survey aspects. Females had significantly higher scores for burnout (p<0.01) and empathy (p=0.04) as compared to males; while males had significantly higher QOL scores (p<0.01) as compared to females. Average scores for the TFA scale were 23.2 (possible range of 7-42). Fourth year pharmacy students scored significantly higher (25.0) for TFA as compared to second year pharmacy students (21.9; p<0.01). Burnout (OLBI) and empathy (IRI) scores were highest in third year students. No significant differences were noted across the curriculum in QOL scores. Conclusions: Pharmacy students’ TFA increased as they progressed throughout the curriculum, suggesting students become more tolerant with additional didactic and experiential exposure. Third year students appear to experience the greatest levels of burnout but also empathy.

Assessment of Interprofessional Preparedness in Early Versus Late Advanced Pharmacy Practice Experiences
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Objective: To evaluate interprofessional preparedness, comfort, and confidence of fourth professional year pharmacy (P4) students in early compared to late advanced pharmacy practice experiences (APPEs). Methods: A web-based survey was emailed to P4 students during the final week of their ambulatory care or inpatient medicine rotation during the first two (early APPEs) and last two (late APPEs) blocks during the APPE year. The survey included nine questions to assess student perceptions of interprofessional preparedness. Question types included Likert-type scales, rankings, select all that apply, and open-ended questions. Mann-Whitney U tests were used to evaluate differences between groups in regard to Likert-type questions. Statistical analysis was completed utilizing Stata version 13 and Microsoft Excel version 16.28. Results: The survey was sent to 146 students in the four APPE blocks. Forty-eight students completed the survey (32.9%); 19 in early APPEs and 29 in late APPEs. Students later in APPEs responded significantly more positive to feeling ready (93.1% vs. 73.7%, p=0.0047) and confident in their ability (86.2% vs. 52.6%, p=0.0224) to contribute as a member of an interprofessional team. The majority of students in all four blocks reported positively that the curriculum prepared them to function effectively and professionally on an interprofessional team (89.6%) and that they feel comfortable interacting with other health professionals (95.8%). Conclusions: Students in late APPEs reported more readiness and confidence to work on an interprofessional team as compared to students in early APPEs. More opportunities for students to participate in interprofessional care prior to the APPE year may help students feel prepared, comfortable, and confident in their abilities to contribute to an interprofessional team when they begin APPEs.

Assessment of the International APPE Student Rotations from Student Reflections
Catherine Vollmar, St. Louis College of Pharmacy, Roma Ryan, St. Louis College of Pharmacy, Stephanie Lukas, St. Louis College of Pharmacy.

Objective: International APPE rotations allow students to teach, participate in research or be involved in patient care at sites around the world. After completion the international rotation, students are required to reflect on their experiences in writing, assisting students in processing their experience and their learning. This study aims to assess students perceptions of their learning, identifying specific themes to further the understanding of how international learning experiences impact pharmacy students. Methods: A year’s worth of reflections were de-identified and compiled and coded according to central themes. All reflections were coded separately by each researcher and then compared; any differences were discussed and coded according to consensus. The main themes were analyzed and categorized into two main classifications: pharmacy-specific skills and transferable skills. Transferable skills are defined as skills learned through human experiences that can be applied to many careers or personal development (ie, adaptability). Results: Analysis of the 32 reflections resulted in 159 occurrences of the established themes. The most frequently being knowledge of international health systems (n = 15, 47% of reflections), understanding of pharmacy practice
(n = 11, 34%), and understanding of other cultures (n = 10, 31%). 25 (78.1%) of the students reflected pharmacy-specific skills and transferable skills, 4 (12.5%) on pharmacy-specific skills, three (9.4%) on transferable skills only. **Conclusions:** International APPE rotations provide opportunities for students to grow both as pharmacy professionals – being able to see a broader view of pharmacy and learning new skills to incorporate into their future careers – and as individuals – being able to interact with others with diverse backgrounds, improving their ability to communicate and increasing their adaptability.

**Automated Analysis of Preceptor Comments: The Use of Sentiment Analysis to Characterize Student Issues**

Kathryn A. Fuller, University of North Carolina at Chapel Hill, Carly Lupton-Smith, Johns Hopkins University, Robert Hubal, University of North Carolina at Chapel Hill, Alice Hann, Vorandi Kahandage, Jacqueline McLaughlin, University of North Carolina at Chapel Hill.

**Objective:** The purpose of this study was to develop and refine a digital tool that can automatically characterize preceptor comments about students on Advanced (APPE) and Introductory (IPPE) Pharmacy Practice Experience evaluation forms. **Methods:** Preceptor comments were collected from student mid-point evaluations in August 2019. In Phase 1: Calibration, two individuals independently coded 50 comments as 1- ‘student at risk’ and 0- ‘student not at risk’. Results were used to identify terminology that was indicative of students at risk for failing a rotation. These terms were added to the dictionary of an R-based sentiment analysis program. In Phase 2: Validation, 383 comments were analyzed using the program. The program scored each comment as positive or negative. Two individuals independently coded the results as 1- ‘program was correct’ and 0- ‘program was incorrect’.

Additional terms indicative of at-risk students were identified. Agreement between individuals is represented as frequency (%). **Results:** In phase 1, the level of agreement was 96.00% (n=48). Terms added to the program included struggle, deceit, lost, unprepared, punctuality, failed, concern, and disappoint. In phase 2, the level of agreement was >90%. After reaching consensus on remaining items, researchers determined that the program coded 91.38%(n=350) of comments correctly; the program inaccurately coded 37(9.66%) comments as positive and 6(1.31%) comments as negative. Additional terms identified for the sentiment analysis dictionary included disruptive, misunderstanding, tardy, late, arrogance, and inappropriate. **Conclusions:** In experiential education, qualitative comments can provide important context about student performance, but can be time-intensive to review. Tools, such as sentiment analysis, can enable experiential staff to efficiently identify and respond to potential issues. Further refinement is needed to improve accuracy and ensure negative comments are not miscoded as positive.

**Calibrating Preceptor Use of Levels of Entrustment**

Jeanne E. Frenzel, North Dakota State University, Allison Hursman, North Dakota State University, Lisa Marie Richter, North Dakota State University, Joan L Viets, North Dakota State University.

**Objective:** To calibrate introductory (IPPE) and advanced pharmacy practice (APPE) preceptors’ use of levels of entrustment in the evaluation of pharmacy students. **Methods:** Participants were preceptors for IPPE and APPE students. Faculty developed cases about fictional pharmacy students at different progress points on different rotations throughout their experiential training. Cases were sent to preceptors using Qualtrics. Preceptors were asked to apply a level of entrustment (Level 1 to Level 5) to the fictional student. Data were analyzed to determine differences in mean assigned level of entrustability by preceptor demographics. **Results:** The sample consisted of 60 participants (RR 18.9%). One-way ANOVA found statistically significant (p < 0.05) differences between 1 out of 6 constructs of entrustment by age of the preceptor and completion of a residency, and between 2 out of 6 constructs by number of hours spent with an APPE student. Post-hoc analysis indicated that level of entrustment of a student on an institutional APPE was statistically significantly different between preceptors aged 21-30 years and ages 31-40 (p = 0.04), that level of entrustment of a student on a community pharmacy APPE was significantly different between preceptors who did not complete a residency and preceptors who completed a post-graduate year 2 residency (p = 0.01), and that level of entrustment of a student on a community pharmacy APPE was significantly different between preceptors who spent zero hours with their student compared to those who spent greater than 6 hours per day with their student (p = 0.01). **Conclusions:** Results of this study found consistent use of levels of entrustment between introductory and advanced pharmacy practice experience preceptors affiliated with North Dakota State University.

**Do Prescription Processing Exercises Improve Students’ Attitudes and Perceptions of Prescription Processing During Community IPPE?**

Anthony L. Walker, The University of Louisiana at Monroe, Agape L Skinner, University of Louisiana at Monroe, Maletta T Kokoricha, The University of Louisiana at Monroe, Stacy T Starks, The University of Louisiana at Monroe.
Objective: This study assessed the differences in attitudes and perceptions between student pharmacists who participated in simulated prescription insurance processing exercises in their ILS-II course compared to student pharmacists who took the ILS-II course prior to the addition of the simulated prescription insurance processing exercises. Each of the two student groups had the same prescription insurance processing lectures in the classroom. We hypothesize that the students with simulated prescription insurance processing experience would be more confident during their first Community IPPE than the students without the simulated prescription insurance processing experience. Methods: An electronic survey targeting third year (P3) and fourth year (P4) student pharmacists, who completed ILS-II and their Community IPPE, was used to assess students’ attitudes and perceptions of prescription insurance processing during their Community IPPE. The P4s only had prescription insurance processing lectures in the classroom, while the P3s also participated in the simulated lab exercises. Student participation in this study was voluntary, and the information was collected anonymously. This study received IRB approval. Results: Seventy-five percent of the P3 students felt the simulated prescription insurance processing lab exercises were necessary for success in Community IPPE compared to 27% of P4 students. Of the P4 students, 87.8% felt having a simulated prescription insurance processing lab would have been beneficial. Forty-four percent of P3 students felt prepared for prescription insurance processing during Community IPPE compared to 9.1% of P4 students. Conclusions: Simulated prescription insurance processing exercises in pharmacy practice labs appear to improve student pharmacists’ confidence during their first Community IPPE. However, further studies may be warranted due to the relatively small sample size of this study.

Easy as 1, 2, 3: Assessing Levels of Entrustability on Advanced Pharmacy Practice Experiences
Courtney R. Caimano, Albany College of Pharmacy and Health Sciences, Laurie L. Briceland, Albany College of Pharmacy and Health Sciences.
Objective: The purpose of this study was to determine what level of entrustability preceptors have in students based on the student’s Advanced Pharmacy Practice Experiences (APPE) performance. It was hypothesized that most students would be entrusted at higher levels of entrustability at both the end of each rotation and during rotations toward the end of the APPE cycle. Methods: With the 2019-2020 APPE cycle, preceptors rated the level of entrustability that they had in students based on their APPE performance. Three entrustability levels were defined for preceptors: Level 1: Student observes; Level 2: Student performs with proactive supervision; Level 3: Student performs with reactive supervision. CORE ELMS evaluations were used to collect preceptor-submitted information. De-identified data on preceptors’ submissions was extracted, including rotation type and date in cycle, and level of entrustability at both midpoint and final. Results: A total of 1,672 evaluations were reviewed. At midpoint, preceptors evaluated students at a Level 2 most frequently (56%), followed by Level 3 (37.5%) and Level 1 (6.5%). Students were evaluated at Level 3 (71%) most frequently at final, followed by Level 2 (26%) and Level 1 (3%). Students were rated at Level 3 more often after community and institutional APPEs (80.2%) compared to non-direct (73.9%) and direct patient care (65.3%) APPEs. There was no significant difference in preceptor-assessed entrustability levels based on rotation date within the APPE cycle. Conclusions: A majority of students, more so in community and institutional APPEs, are entrusted to be able to perform their expected duties with reactive supervision by the end of an APPE, regardless of rotation date within the cycle. Targeted initiatives may be developed to address students evaluated at a Level 1.

Entrustable Professional Activities (EPA) Levels for Distance-Based Global vs. On-Campus Entry-Level PharmD Students
Megan E. Thompson, University of Colorado Anschutz Medical Campus, Shaun E. Gleason, University of Colorado Anschutz Medical Campus, Paul M Reynolds, University of Colorado Anschutz Medical Campus.
Objective: The University of Colorado Skaggs School of Pharmacy introduced EPAs for entry-level students in 2017, and for mid-career, distance-based, global post-baccalaureate PharmD and MS students in 2019. This is a descriptive comparison of the alignment of the student level of EPA self-assessment with preceptor level of EPA assessment across curricular pathways and practice settings. Methods: Available EPAs include AACP Core EPAs for entry-level students, and more robust school-specific EPAs designed for mid-career PharmD and MS students with greater skill levels and local practice needs. Entry-level students complete the AACP Core EPAs, and distance-based students complete school-specific EPAs. Students self-report their perceived entrustability levels; preceptors either agree or disagree with the level reported, by providing their entrustability score. Comparisons between preceptor and student entrustability level were conducted with the Wilcoxon rank-sum test; EPA levels were reported as medians. Results: Distance-based student self-evaluations of EPA performance are aligned
with preceptor assessment both in the healthcare (EPA 3 student vs 3 preceptor; NSS) and community setting (EPA 4 student vs 4 preceptor; NSS). Conversely, entry-level student self-evaluations of EPA performance was lower, despite preceptors evaluating them as having a higher level of entrustability in both settings (health-system: EPA level 2 student vs 3 preceptor; P =< 0.001; community: EPA level 2 vs 3 preceptor; P <0.001). **Conclusions:** Mid-career, distance-based post-baccalaureate PharmD and MS students are more aware and confident in their abilities to perform higher level school-specific EPAs, versus on-campus entry-level students who perform the AACP Core EPAs tasks. Entry-level students’ rated themselves lower in level of entrustability, which was not consistent with preceptors’ higher rating. This suggests a need for preceptor re-education on assessment of EPAs and School expectations for levels of entrustability.

**Evaluation of Knowledge and Confidence Among Students on Advanced Practice Experiences Regarding Beta-lactam Allergy Management**

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**Objective:** Beta-lactam allergies complicate antibiotic selection. Reconciling these allergies is important for optimal patient care. This study was designed to survey Advanced Pharmacy Practice Experiences (APPE) pharmacy students at five colleges of pharmacy to determine self-perceived knowledge and confidence regarding beta-lactam allergies. **Methods:** This IRB-approved survey was distributed from 2019-2020 to current APPE students. The survey contained introductory questions, self-perceived knowledge questions, and confidence questions related to basic (patient counseling) and complicated (penicillin skin testing) areas of beta-lactam allergies. The study population was divided into two subgroups based on assignment to an infectious disease (ID) rotation. Chi-square and Fisher’s exact tests were used for comparative analysis as appropriate. **Results:** The survey was completed by 160/521 (31%) students. Eighty-four percent of respondents reported management of beta-lactam allergies as part of a course with 38% reporting an ID rotation. Students chose “knowledgeable” and “very knowledgeable” for surface level topics (44% and 29%, respectively), and “somewhat knowledgeable” or “not knowledgeable” for more application-based topics (36% and 28%, respectively). Students assigned to an ID rotation were more likely to choose “knowledgeable” or “very knowledgeable” for more complex topics (p =0.043 and 0.008, respectively). Unassigned ID rotation students were also more likely to choose “not knowledgeable” regarding penicillin challenges (p =0.006). Assigned ID rotation students were highly confident in counseling patients about penicillin allergies and penicillin skin testing compared to unassigned students (p =0.005 and 0.022, respectively). **Conclusions:** Students reported decreased confidence in most application-based questions regarding beta-lactam allergy management. Students assigned to an ID rotation conveyed greater knowledge and confidence when compared to students without exposure. More research is needed to optimize beta-lactam education within pharmacy curricula.

**Faculty Versus Student Assessment of Interprofessional Competencies Using a Validated Assessment Tool**

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**Objective:** To determine if a difference exists between student self-assessment and faculty assessment of interprofessional competencies using a validated assessment tool for a case-based interprofessional learning activity. **Methods:** In fall 2018, third year pharmacy students participated in a case-based IPE learning activity via a recorded video call. The teams consisted of one pharmacy student paired with two medical students or one to two physician assistant, one to three nursing, and one to two physical therapy students with a goal of developing a collaborative patient care plan. In spring 2019, the students were instructed to view their recording and assess their performance utilizing the Pharmacist Interprofessional Competencies Tool (PICT). Three faculty evenly split the video recordings and also assessed the students. Faculty were trained to use this tool to ensure consistent evaluation. The PICT assesses five interprofessional criterion: collaboration, ownership, respect, engagement, and application based on four competency levels: unacceptable (1), novice (2), competent (3), or proficient (4). Descriptive statistics and a two-sided Wilcoxon Signed-Rank Test with α=0.05 were used to analyze the data. **Results:** The analysis included 122 students. The average criterion score for students and faculty are as follows, respectively (mean ± SD): collaboration (3.02 ±0.67, 2.93±0.50), ownership (3.06±0.68, 2.99±0.58), respect (3.45±0.75, 2.84±0.37), engagement (3.17±0.64,
2.87±0.50), and application (2.95±0.67, 2.97±0.51). There were significant differences in assessment of respect (p<0.0001) and engagement (p<0.0001). No differences were found for collaboration (p=0.207), ownership (p=0.464), or application (p=0.842). **Conclusions:** Students were able to accurately self-assess the interprofessional competencies of collaboration, ownership, and application, but not able to for respect and engagement. The PICT should continue to be used by trained evaluators during interprofessional learning activities to provide consistent feedback and move pharmacy students toward team-readiness.

**How Should Schools Better Prepare Students to Combat Opioid Crisis? Results from Student Focus Groups**

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**Objective:** The opioid epidemic is a public health emergency. Student pharmacists in the United States (US) are interacting with patients using opioids during their internships and experiential training. A collaborative task force from the AACP Experiential Education Section and Substance Use Disorder SIG was charged with gathering student perspectives regarding opioid use to inform pharmacy educators and practitioners on how to address the crisis with their students. Focus groups were conducted with students from eight pharmacy schools to assess what opioid-related experiences student pharmacists have had and their current perspectives regarding the crisis.

**Methods:** Students from each professional year at participating schools were asked to volunteer for focus groups with peer classmates to answer questions about their experiences with the opioid crisis. Faculty and/or staff moderated the 1-1.5 hour focus groups, audio recording responses. Recordings were deidentified, transcribed, and analyzed. IRB exemption was obtained through each school.

**Results:** 151 students participated. Responses were categorized according to themes using a consensual qualitative research (CQR) approach. Sources impacting student views on the crisis include school, personal and work experience, and media. Changes in perspective since starting school included an increase in knowledge, decrease in bias/stigma, and increase in awareness. Schools can better prepare students with more skills training on opioid counseling, naloxone, and having difficult conversations with patients.

**Conclusions:** The results of the research project will be beneficial to pharmacists and pharmacy schools as they educate and equip students to combat the crisis. The results will help document what student pharmacists are learning about the opioid crisis and practices they are seeing in their pharmacy experiences and provide baseline information needed to develop ideas and recommendations to address the crisis.

**Implementing A Competency-Based Experiential Education (EE) Curriculum to Evaluate and Improve Student Professionalism and Skill**

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**Objective:** To implement a competency-based experiential education (EE) curriculum to evaluate and improve student professionalism and skill conducting entrustable professional activities (EPAs). **Methods:** In 2019, the Office of Experiential Education (OEE) at MCW School of Pharmacy developed competency-based assessments for introductory (IPPE) and advanced (APPE) pharmacy practice experiences. Professionalism is divided into five standards and assessed by how consistently the student met each standard. Any assessment other than “consistently meets” is subject to remediation. Remediation may include a written reflection, meeting with the Director of EE, or development of a SMART goal. EPAs are assessed via rubrics that contain critical elements for successful completion. If any critical element is not achieved, the student repeats the activity until successful. **Results:** At the end of four APPE blocks, 26 remediations were assigned. 16 were for professionalism and 10 for EPAs. Three APPE students remediated professionalism at the midpoint for two rotations, but demonstrated improvement on the final evaluation. All students who remediated an EPA successfully completed the remediation. At the end of two IPPE rotations, 10 professionalism remediations were assigned. Two students remediated professionalism at the midpoint for two rotations, but showed improvement on the final evaluation.

**Conclusions:** Implementation of a competency-based EE curriculum allows for early identification and remediation of students who struggle with professionalism and EPAs.

**Implementing a High-Risk Medication Education (Anticoagulant and Antiplatelet) Introductory Pharmacy Practice Experience (IPPE)**

Sarah R. Cox, University of Missouri-Kansas City, Angela Brownfield, University of Missouri-Kansas City,

Angela Brownfield, University of Missouri-Kansas City, Sarah R. Cox, University of Missouri-Kansas City. 

Objective: The purpose of this project was to implement a sustainable high-risk medication education (HRME) experience for student pharmacists, assess the impact on institutional metrics, and evaluate student competence. 

Methods: Third year students on a distance campus completed a longitudinal IPPE to provide patient education on anticoagulant and antiplatelet medications. Students discussed each patient and counseling pearls with the preceptor, educated the patients, reviewed patient interactions, and documented education points discussed with the patient in the EMR. Data collected included: student feedback on the experience, the achievement of applicable Pre-APPE core domains, student effect on number of patients counseled, and number of patient interactions per student. Results: Student feedback of the HRME experience indicated that 98% either strongly agreed or agreed to meeting defined parameters. Ninety-seven percent of the students completing the experience demonstrated achievement of all applicable domain abilities. Over a three-year period, the institutional rate of anticoagulant and antiplatelet education increased by an average of 13%. Each student educated an average of 13 patients per HRME academic year. Conclusions: The creation of a sustainable HRME experience allowed for the achievement of applicable Pre-APPE Core Domains. It also enhanced institutional metrics by increasing the number of patient touches and providing students with direct patient care opportunities on a consistent basis. To implement a similar HRME strategy, stakeholders would need to consider the following: the longitudinal nature of the IPPE in which this experience resides, availability of an academic pharmacy practice partnership, and the class size. Faculty will also need to consider whether the structure of an existing IPPE program can be modified and if they have willing health system partners with sufficient patient activities to support the experience.

Longitudinal Educational Aptitude Development: Taking the LEAD on Curricular Relevance--Preceptor Perceptions 

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Objective: AACP graduating student survey responses have suggested a growing ambivalence about perceived relevance of foundational coursework in the provision of patient care. We identified a need to develop connections to assist students with understanding importance/relevance of foundational courses. Current efforts across the academy remain fragmented and literature presents more theoretical models than actual studies that address relevance. This project describes preceptor impressions regarding the relevance and value of foundational courses in the PharmD program. Methods: A 12-question (matrix table and open-ended responses) Qualtrics survey was sent to School of Pharmacy preceptors who received students during the 2019-2020 APPE year that probed relevance, value and advice to students on 4 different courses (biochemistry(B), pharmacology /medicinal chemistry (PMC), pharmacokinetics (PK), and pharmaceuticals (PC)) related to courses taught later in the curriculum. IRB was exempted due to the CQI design. Results: Responses totaled 32 (38%), with 59% NU graduates and 56% with >10 years practice experience. Common practice settings of respondents included community (34%), Inpatient-academic (19%) and inpatient-community (16%). All foundational courses were perceived to have strong correlation with all other courses evaluated, with highest correlations between PMC and therapeutics (81%), antiinfectives (75%), and pharmacy practice (75%). Comment trends included adding clinical application exercises to foundational courses for student context/relevance and to be an effective pharmacist one should be able to counsel, educate, and comprehend how drugs work in the body. Conclusions: Preceptors highlighted the importance of all foundational courses to all other courses in the curriculum and to successful pharmacy practice. These results are being shared with all preceptors in the SOP as well as our curriculum revision task force to further discussions for enhanced curricular integration and efficiency.

Monitoring and Early Intervention in Students at Risk for Substandard Performance on Advanced Pharmacy Practice Experiences 

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Objective: To describe a monitoring and early intervention process for students at risk of substandard performance on Advanced Pharmacy Practice Experiences (APPEs). Methods: Using a dashboard of key indicators, students with potential deficits in knowledge, skills, or professionalism were identified as at risk for substandard performance on APPEs. At-risk students were initially designated as RED monitoring status, (check-in by the experiential office within the first week of each rotation). After two APPEs, students without significant issues were de-escalated to YELLOW status (timely review of midpoint evaluation). Continued success resulted in de-escalation to GREEN status (no additional monitoring). Monitored students who had issues or received
substandard evaluations were retained/reinstated to RED status and the experiential office developed deficit-specific action plans. Action plans and outcomes were documented using the Salesforce platform. **Results:** For the 2018-2019 APPE year, 44 at-risk students were identified. Of these, the monitoring level for 23 students (52%) was de-escalated on schedule. Of the 21 students who did not de-escalate on schedule, four were delayed but eventually reached GREEN, nine were delayed and never reached GREEN, four regressed, and four failed to de-escalate despite interventions. Two students were placed on remediation experiences and three failed or were removed from APPEs. A total of 86% of at-risk students completed their rotations successfully on first attempt. **Conclusions:** With a student monitoring and intervention process, the vast majority of at-risk students were able to complete rotations successfully on first attempt. A monitoring and early intervention process may be beneficial in assisting at-risk students to successfully complete advanced pharmacy practice experiences.

**Post-APPE Structured Self-Reflections: Characterization of Impactful Learning Themes and Evidence of Actionable Professional Development Plans**

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**Objective:** Self-reflection is one documented curricular strategy employed to develop and assess student professionalization. While we have long employed post-APPE reflection, we had done so in an open-ended format, making it difficult to quantitate/assess. For the 2019-20 cycle, a four-step structured self-reflection exercise was introduced to better capture student professionalization on APPEs. The objectives were to evaluate student self-reflections to categorize the learning/professionalization themes selected as the most impactful experience(s); and to evaluate each reflection for evidence of transformative learning/actionable professional development plans.

**Methods:** For each APPE completed by the Class of 2020, students submitted a 300-500 word self-reflection for evaluation by Experiential Education (EE) faculty. EE created a 4-step format for self-reflection entitled "IDEA": Identify one most important/impactful learning experience (theme); Describe theme using subjective and/or objective information; Evaluate theme; and Actionable Plan: upon self-reflection, what is your professional development plan? EE faculty created a rubric to evaluate each IDEA reflection. Reflection themes were collated for each student for Modules A-E (May-December 2019); from 15 possible choices, themes were grouped into 4 categories. **Results:** 957 reflections were evaluated for 211 students. Students selected themes in the four overarching categories of Practice Skills Development/Experiencing New Curricular Discipline (31%), Patient Counseling/Communication Skills (28%), Professionalization/Self-awareness/Career Development (23%), and Collaborative Teamwork (16%). Of these, 717 (75%) were evaluated as critical reflection, indicative of presence of actionable professional development plans. **Conclusions:** Implementation of IDEA structured self-reflection enabled us to readily identify the most impactful component of the APPE upon students' professional development, which spanned domains of Practice and Communications Skills Development, Professionalization/Self-awareness and Teamwork. 75% of students demonstrated actionable professional development plans, leaving some room for improvement of our process.

**Quality Assessment of a New Entrustable Professional Activity Evaluation Tool for Advanced Pharmacy Practice Experiences**

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**Objective:** The purpose of this analysis is to evaluate the reliability of a new entrustable professional activity (EPA) assessment tool by comparing calculated grades to preceptor suggested letter grades. **Methods:** The assessment tool was designed to measure 18 EPAs, including 14 of the Core EPAs for New Pharmacy Graduates, and four program-specific EPAs. Expected levels of entrustment were determined for each EPA. The assessment tool also contained key elements related to personal growth and development (self-awareness, leadership, innovation, and professionalism) and one student-blinded section for preceptors to recommend a suggested letter grade. Scores for the applicable EPAs and professionalism were equally weighted and combined to calculate the final grade. The areas of self-awareness, leadership, and innovation were evaluated but not factored into the final score. The assessment calculated grades were compared to preceptor suggested grades for 92 students completing 428 APPEs from May 2018 to May 2019. **Results:** Preceptor suggested letter grades and calculated grades from the tool were congruent in 407 (95%) of completed APPEs (Chi Square, $p = .001$). Twenty-one grade disagreements (5%) were observed. Grade disagreements were evenly
distributed with 11 grades being 1 grade higher than recommended and 10 being 1 grade lower. No grade disagreements resulted in a student receiving a passing grade when the preceptor indicated a failing grade was earned or a student failure when the preceptor indicated a passing grade was earned. **Conclusions:** This correlation suggests that the EPA assessment tool is a reliable method for assessing student EPA performance in the APPE year at our institution. Colleges challenged with determining reliability of a similar tool may benefit from this type of analysis.

**Retrospective Influences in Advanced Pharmacy Practice Experience Selection**


**Objective:** To retrospectively assess student perception of factors that influenced Advanced Pharmacy Practice Experience (APPE) selections at the Wilkes University Nesbitt School of Pharmacy (NSoP). **Methods:** After completing APPE rotations, 71 fourth professional year (P4) students completed an anonymous survey to retrospectively assess which factors they should have considered when ranking rotation sites. Out of 17 factors, the students were required to rank at least three and up to five that they deemed important after completing their APPEs. The survey also assessed any changes students would make to their APPE experiences. **Results:** 54 P4 students (77%) completed the survey. The top selection factor ranked by P4 students was location, followed by area of interest in specialty, cost/housing, level of difficulty, and peer recommendation, respectively. Most students reported they would not change their APPE experiences, but 33% of students would go back to complete an international rotation if possible. 96% of students agreed they were satisfied with their APPEs, with internal medicine and elective APPEs having the highest satisfaction. 96% agreed APPE experiences influenced their postgraduate plans, with elective, ambulatory care, and inpatient general medicine being reported as the most influential, respectively. Most students (33%) acquired a job/postgraduate training in the hospital setting, and 96% of students agreed they were happy with their postgraduate career selection. **Conclusions:** Location has been shown to be the top factor for students when selecting their APPE experiences. Including more information on site location and gauging where students are geographically may be beneficial. Area of interest in specialty and elective APPEs have also shown importance to students, so including more elective opportunities in different specialties may better prepare students when deciding postgraduate plans.

**Student Self-Evaluation Practices and Perceptions in Experiential Education**


**Objective:** According to ACPE Standards 2016 and published EPAs, students should accurately self-assess knowledge and skills. Our objective was to determine how student perceptions and practices affect self-evaluation scores in experiential education. **Methods:** Student self-evaluations for IPPEs and APPEs of current P2, P3, and P4 students were matched and compared to preceptor final evaluations with mean ± SD absolute differences calculated. Second and third-year students have completed two and three IPPE self-evaluations, respectively. Fourth-year students have completed six to nine APPE self-evaluations. Additionally, a 13-question survey regarding student self-evaluation practices and perceptions was emailed to all 139 P2, P3, and P4 students. **Results:** The mean ± SD absolute difference between student self-evaluation and preceptor scores was 1.7 ± 1.7 (IPPEs) and 2.8 ± 2.4 (APPEs), 100-point scale. Survey response rate was 62.0% (P2), 71.1% (P3), and 62.7% (P4) students. Of P2 and P3 students, 27.6% stated they had “sometimes,” “regularly,” “usually” or “always” inflated their self-evaluation grades in order to influence preceptor grades. Only 12.6% of P4 students stated the same. In comparison, 53.4% (P2 and P3) and 75% (P4) students stated they had “sometimes” or more frequently lowered self-evaluation scores because of their preceptor. Finally, 82.7% (P2 and P3) and 81.3% (P4) students “agreed” that self-evaluations should not include grades. **Conclusions:** While the reliability of IPPE and APPE self-assessment and preceptor rubrics appears strong, many students report “sometimes” inflating or lowering self-evaluation grades due to preceptor influence. This may explain why 82.2% of all students “agreed” that self-evaluations should not include grades. Restructured self-evaluations may allow more focus on student performance, less on grades. Additional study is needed to determine if non-graded self-evaluations provide a better assessment of performance.

**Timing Impact of APPE Blocks Off for NAPLEX Success for First-Time Test Takers**


**Objective:** Examine the association between Advanced Pharmacy Practice Experience (APPE) rotation blocks off in the Doctor of Pharmacy (PharmD) program and first-time test taker success for passing NAPLEX. In the 8
blocks offered within the PharmD program, students complete 6 rotations each 6 weeks in length, leaving 2 blocks off. Frequently, students request the last 1-2 blocks off so they can prepare for NAPLEX. Faculty may perceive that extensive time off (up to 12 weeks with no courses) at the end of the program could hinder student success. Methods: Utilizing means, standard deviations, and multivariate linear and logistic regression models, the association between APPE placements and NAPLEX scores (total scores and pass/fail) for the PharmD Class of 2018 was investigated. Results: Examining the last 3 APPE blocks in Spring prior to graduation, the Class of 2018 (N=278) had 25 students complete 1 rotation, 117 students complete 2 rotations, and 136 students complete 3 rotations. For students who took the NAPLEX, passing average was 82.8% (average score 91.5, SD 18.1). NAPLEX pass rate was 81.8% for students with one rotation (average score 89.2, SD 15.6), 79.2% with two rotations (average score 92.4, SD 20.6), and 86.6% with three rotations (average score 90.9, SD 15.7). In a multivariate logistic regression, 3 blocks had significant impact on passing success compared to 1-2 blocks: OR 3.29 (95% CI 1.30, 8.05) after adjusting for cumulative GPA and gender of the student. Conclusions: This data supports that extensive time off towards the end of the program may impact NAPLEX success for a cohort of students. Programs may use this information as part of student success initiatives and as part of APPE scheduling considerations.

Use of Lightboard Video Instruction in the Pharmacokinetics Pharmacy Classroom

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Objective: Lightboard technology is an innovative form of video instruction utilizing a combination of handwritten, verbal, and visual methods. While a flipped classroom approach has gained popularity, the use of Lightboard technologies has been slower to implement. A subsequent gap in understanding of how interactive Lightboard videos can assist with student learning is present especially in multiple settings such as pharmacy schools. The purpose of this study is to evaluate student satisfaction in response to Lightboard videos depicting pharmacokinetic calculations. We hypothesized the students would express a positive response to the addition of the Lightboard videos and believed students would feel the videos improved their understanding of the course’s mathematical concepts. Methods: Following in-class lectures of one-compartment and multicompartment pharmacokinetic models, two Lightboard videos were deployed. Students were provided access to an optional survey with 9 questions to assess perceived helpfulness and satisfaction with the Lightboard videos. Results: 80.5% of the 113 students provided complete responses, with most responses falling into a category considered positive on a Likert scale. 95.6% of students agreed or strongly agreed the Lightboard videos were engaging, and 92.2% felt they had a better understanding of the material. 86.8% of students felt the Lightboard videos resolved questions regarding pharmacokinetic calculations. 51.2% believed the Lightboard videos were the second most helpful aspect, which closely followed in-class lectures (67.9%), and 95% of students wanted more videos incorporated into the course. Conclusions: While this study did not account for examination scores, student satisfaction and perceived usefulness may be helpful in providing guidance for the types of videos used to supplement mathematical concepts, specifically pharmacokinetic calculations. Future implementation of Lightboard videos throughout the course include concepts in theoretical pharmacokinetics.

Using Our IDEAS (Interdisciplinary Education Apartment Simulation) to Promote Interprofessional Education and Collaborative Practice

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Objective: (1) Describe an innovative IPE model that uses a real-world home environment to promote interprofessional education and collaborative practice. (2) Assess the changes in interprofessional collaboration-related competencies in health professional students before and after completing a home-based care simulation. Methods: This innovative IPE model allows students from six different disciplines, dentistry, medicine, nursing, occupational therapy, pharmacy (P3 & P4 students), and physical therapy to participate in a simulated home visit in a real-world setting. Students participate in a patient interview with a standardized patient, conduct a home assessment, and complete a structured debriefing session in a house/apartment located outside of the health sciences center. Faculty facilitators from each discipline develop the case scenario and create a home environment with potential medical issues and environmental hazards for the students to identify and educate each other about during the interview and assessment. Student behaviors are measured using the Interprofessional Collaborative Competencies Attainment Survey (ICCAS), a 20-item retrospective pre/post analysis of interprofessional collaboration-related competencies. Results: Forty-one learners completed the activity through the Fall 2019 semester. ICCAS data showed that for every measure of perceived ability, learners showed a
statistically significant increase at post-test measurement, compared to their ratings at the pre-test. In a majority of the cases, a modest or strong effect size was observed, suggesting a substantial increase in perceived ability. **Conclusions:** Through completion of this real-world collaborative experience, students will be better prepared for clinical rotations and careers as healthcare providers in home care environments and beyond where teamwork is essential. This activity promotes current healthcare trends such as the Aging in Place initiative and the need for improved transitions of care across healthcare settings.

**LIBRARY AND INFORMATION SCIENCE**

**Apples to Oranges: Comparing Citation Counts and Altmetrics Across Pharmacy Departments**

Emily F Gorman, *University of Maryland.*

**Objective:** The purpose of this study was to determine if citations and alternative metrics (“altmetrics”) differ among the three departments at the University of Maryland School of Pharmacy (UMSOP), using publications from 2017. **Methods:** The 254 publications by UMSOP authors in 2017 were identified using a Scopus affiliation search. The publications and their citation data were downloaded and sorted by the school’s three departments: Pharmaceutical Health Services Research (PHSR), Pharmaceutical Sciences (PSC), and Pharmacy Practice & Science (PPS). Altmetrics data (e.g., social media mentions, Attention Score) were retrieved from Altmetric.com and PDF download counts were recorded from publisher websites when available. Statistical analyses were conducted to compare these metrics across departments. **Results:** Altmetric.com data were available for 57 of 72 PHSR publications (79.17%), 69 of 84 PPS publications (82.14%), and 75 of 103 PSC publications (72.82%). There were statistically significant differences among the departments in number of citations (ANOVA $p=.002$), number of Tweeters (ANOVA $p=.001$), Altmetric Attention Score (AAS; ANOVA $p=.001$), and number of PDF downloads (ANOVA $p=.018$). Post hoc testing revealed that PSC was cited more than PPS ($p=.000$). PHSR had higher AAS than PSC ($p=.015$), and PSC was tweeted less than PPS ($p=.002$) and PHSR ($p=.005$). PSC had more PDF downloads than PHSR ($p=.008$). The number of readers on the Mendeley research sharing platform did not differ significantly among departments. **Conclusions:** Pharmacy departments differ in their type of research impact as measured by citations and altmetrics. While the basic sciences still mostly receive traditional citations, other disciplines have a broader presence in social media and other areas. This diversity should be taken into consideration during annual review and promotion and tenure evaluations.

**Evaluation of a Practice Activity to Improve Performance on a Drug Information Practical Examination**


**Objective:** To evaluate whether participation in a structured, simulated practice examination is associated with improved doctor of pharmacy (PharmD) student performance on a practical drug information final examination. **Methods:** PHRM 322 (Drug Information) is a required, fall semester, first professional year (P1) course in drug information. The final examination for the course contains a traditional, closed-book electronic portion and a practical application section, requiring students to demonstrate ability to execute key drug information skills, such as conducting a PubMed search, locating and using a clinical practice guideline, and navigating tertiary drug information databases. In order to improve performance on this portion of the examination, an electronic, structured, simulated practice examination was offered to students. Performance on the final examination and overall course points were analyzed for the students enrolled in the course in 2017, 2018, and 2019. Actual examination performance for students who participated in the activity was compared to performance of those who did not participate using multiple linear regression to control for overall course performance as a covariate. **Results:** Of 211 eligible students, 100 (47.4%) participated in the practice examination. Mean scores on the final examination as a whole (79.3% vs. 71.9%, $p<.001$) and practical portion of the final examination (84.4% vs. 77.6%, $p=.001$) were higher for students who participated in the practice examination. When accounting for overall course points as a covariate, the adjusted difference on the practical portion was 5.0% (95% CI 2.0% to 7.9%, $p=.001$) in favor of participators. **Conclusions:** The practice examination was associated with improved performance, even when accounting for the students’ overall performance in the course. This activity will be required in future course offerings.

**Impact of an American Medical Association Citation Guide on Pharmacy Student Citing Performance**


**Objective:** Direct instruction in proper citation format and practice exercises are the greatest contributors to improving student citation usage. Our aim was to...
determine the impact of a customized American Medical Association (AMA) citation guide on student performance and confidence in citing. **Methods:** Faculty, including the pharmacy librarian, developed an AMA citation guide. Prior to its implementation in Spring 2019, third-year pharmacy students completed an assessment to identify citation components of different resources and rated their confidence citing literature. After guide dissemination, students repeated the assessment, plus additional questions about the usefulness of the guide during rotations and in future practice. Students’ performance on the citation component and total scores of a drug information question were compared against scores from the same students in Fall 2018. Descriptive statistics were used to summarize confidence and guide usefulness questions. Wilcoxon signed rank tests were used to compare pre- (Fall 2018) and post- (Spring 2019) total test scores and scores attributed to the citation component.

**Results:** Of the 120 students, 89.8% did not feel or felt somewhat confident before implementation of the citation guide. After implementation, 53.8% felt confident in their abilities to cite AMA correctly. An overwhelming majority (95.8%) felt the guide helped complete the assignments, 98.3% thought it would be useful on rotations, and 50% wished they had additional practice with citations. Significant improvements (p < .0001) in both total test scores and scores attributed to the citation component were verified after citation guide implementation.

**Conclusions:** Students performed significantly better on their assignments and felt more confident in their citing abilities after the introduction of the AMA citation guide.

**Improving AMA Style Referencing Utilization for a Drug Information Written Project**


**Objective:** To determine the impact of utilizing an intervention for improving performance using the American Medical Association (AMA) Style of referencing for a drug information (DI) written project in a 1st professional year course. **Methods:** Formulating a professionally written paper is an essential component of patient-centered care as stated in Domain 2 of the Center for Advancement of Pharmacy Education outcomes. Pharm. D. candidates may lack experience in citing and referencing when authoring a paper. Over the previous seven years of administering a summative written project requiring a well-referenced DI response to a clinical question, 2019 was the first year for using an intervention to improve AMA referencing utilization performance. During a 2019 DI Retrieval course offering, students were given a formative assignment to practice writing references using the AMA Style and an active learning referencing workshop as preparation for the summative written project. The 2018 scores of the AMA referencing assessment dimension of the written project were compared with that of the 2019 scores using a t-test to determine the impact of this intervention. AMA referencing was one of ten assessment dimensions of a grading rubric using a 4-point Likert scale, defined as: 4 (excellent, no revision needed), 3 (good, minor revision needed), 2 (adequate, moderate revision needed), and 1 (poor, major revision needed). **Results:** The AMA referencing dimension mean scores of the written project for 2019 were significantly higher than the 2018 mean scores, 3.8 and 3.4, respectively (p < .0007). **Conclusions:** This study demonstrated that an intervention involving a practice assignment and an active learning workshop significantly improved AMA Style referencing performance for a professionally written DI project.

**Making the Case for Expanding Drug Information Specialists in Pharmacy Education**


**Objective:** The importance of drug information (DI) in pharmacy education is well known. Although adequate skills in DI and evaluating literature are fundamental to the Pharmacist Patient Care Process (PPCP), funding for drug information specialists (DISs) has declined. The purpose of this report is to evaluate the impact these professionals have on education and to make the case for expanding use of DISs in pharmacy education. **Methods:** A literature search was completed using the keywords: “drug information,” “drug information center,” “pharmacist patient care process,” “drug information specialist,” and “drug information education.” Each article found was systematically evaluated to determine value towards the research question. Evidence from these articles regarding DISs in pharmacy education was synthesized.

**Results:** This research revealed that while there is need for adequate training in DI, the number of formal DI centers (centers) is shrinking. At their apex in 1987, there were 127 formal centers in the United States; in 2018, there were only 82. While responding to DI questions is a main role for these centers, 98% of DI pharmacists perceive students. Additionally, when surveyed about workload, university associated DISs reported that teaching made up 58% of job duties vs an allocated 40%. Despite the importance of these skills, many newly established schools and colleges of pharmacy have yet to invest in
their own centers. **Conclusions:** While providing DI is foundational to all professional duties of pharmacists and the PPCP, there is a clear need for formal DISs and greater exposure between these niche professionals and pharmacy students. Further studies should be performed to determine effects of DI training on student success outcomes as they pertain to literature evaluation and job-readiness.

**Using Drug Information to Integrate Basic Science Concepts with the Practice of Pharmacy**  
Cambrey B. Nguyen, The University of Kansas.

**Objective:** Using drug information (DI) concepts to integrate basic science concepts with pharmacy practice has not been described in the literature. The purpose of this project was to implement DI focused learning opportunities in a lab setting to educate first year pharmacy students about the signif-icance and clinical relevance of basic science concepts, and how these concepts are integral to a pharmacist’s knowledge of drugs. **Methods:** A lecture introduced the integration by mapping the sections of the prescribing information of a drug to the basic science and pharmacy practice courses in the KU curriculum. A second learning opportunity included a “murder mystery” activity in which students utilized knowledge obtained from concurrent P1 courses to determine the cause of death for a patient on warfarin. For the third activity, the students role-played as the FDA Advisory Board and determined whether a product should be recommended for approval through review of animal and human studies. Lastly, the students were required to present a pre-clinical, clinical, or practice-based research article over heart failure. As part of the presentation, the students were required to discuss the relevancy of the journal article to the concepts of basic science and pharmacy practice. Student learning was assessed through grades and an optional survey that featured a written self-reflection on the integration of basic science to pharmacy practice. **Results:** The mean scores for the activities and presentations ranged from 85-98%. Based on the written self-reflection, students were able to describe the relationship between basic science and pharmacy practice based on the learning opportunities offered in the course. **Conclusions:** Future plans are to expand the integration using drug information focused activities and concepts in additional courses in the curriculum.

**PHARMACEUTICS**

**Academic Performance in a Required Online Introductory Pharmaceutics Course is Related to Frequency of Content Re-Engagement**  
Peter L.D. Wildfong, Duquesne University, Ira Buckner, Duquesne University, Carl A. Anderson, Duquesne University.

**Objective:** Identify the association between the frequency of student re-engagement with online course content and academic performance. **Methods:** A 3-credit online course in pharmaceutics was offered for first-year students within a 7-week instruction block. Time estimates for completion of weekly objectives and a schedule detailing day-to-day pacing was provided at the course outset. After course completion, frequency of student access to course content, discussion board, and glossary was analyzed, expressing allocation of time as percentage total hits in each area. Content re-engagement was calculated as the difference in total hits to content folders and the number of individual elements comprising course content. A Pearson coefficient correlated content re-engagement and academic performance for the whole class, while levels and patterns of content use were compared between upper/lower quartiles of the final grade distribution using t-test (significance p<0.05). **Results:** Data from 28 students were analyzed. Access to site areas averaged 85.6%, 13.2%, and 1.1%, respectively for content folders, discussion boards, and glossary. Allocation of time during site access did not differ significantly between upper/lower quartiles of the class. The mean total content re-engagements were significantly higher (p=0.007) for upper quartile students compared to lower quartile students. The total number of content re-engagements showed moderate positive correlation with final grades (r=0.505). On average, upper quartile students revisited course content 1.8x more often than lower quartile students. **Conclusions:** Students consistently accessed online course content to the same proportional extent, irrespective of academic performance. In contrast, a nearly two-fold increase in the number of times course content was re-visited was associated with higher likelihood to be in the upper quartile of the final grade distribution.

**Are Weight Loss Supplements Sold Freely on Amazon and Ebay Safe and Efficacious?**  
Diana M Huynh, Mark Mikhail, Abigail Wiss, University of Saint Joseph School of Pharmacy & Physician Assistant Studies, Natalia Echeverry, University of Saint Joseph School of Pharmacy & Physician Assistant Studies, Kamila Orzechowski, University of Saint Joseph School of Pharmacy & Physician Assistant Studies, Monica Oakes, University of Saint Joseph School of Pharmacy & Physician Assistant Studies, Heba Eassa, Al-Azhar University, Doreen E. Szollosi, University of Saint Joseph, Mohamed I. Nounou, University of Saint Joseph.

**Objective:** Approximately 40% of adult Americans are obese. The estimated attributable annual medical cost of obesity is $190 billion, accounting for 21% of U.S.
healthcare expenditures. Sixty-seven percent of overweight individuals attempt to lose weight, and 15% of U.S. adults have used a weight loss supplement without consulting their healthcare provider. Some weight loss products can contain more than 90 ingredients with limited or no efficacy trials. There is little FDA regulation for supplement manufacturers’ in being safe, efficacious, and not misleading in label claims. This project determined pharmaceutical quality, safety and possible adulteration of purchased Amazon and eBay supplements that may be harmful to a consumer’s health. 

Methods: Twenty highly rated weight loss supplements were selected and purchased from Amazon and eBay for analysis via High-Performance Liquid Chromatography (HPLC) and Near Infra-Red (NIR) spectroscopy to determine their molecular components and possible adulteration. Pharmaceutical quality was determined using content uniformity, friability tests and weight variation tests through SeDeM analysis. 

Results: Various supplements contained undeclared active pharmaceutical ingredients in heterogenous quantities as confirmed by HPLC analyses such as sibutramine, sildenafil, orlistat and phenolphthalein. Furthermore, these products showed poor pharmaceutical quality and consistency as confirmed via NIR, content uniformity, dissolution, friability tests, and weight variation through SeDeM analyses. 

Conclusions: Weight loss supplements are perceived as safe due to their ease of purchase on Amazon or eBay and highly rated reviews seen by the vulnerable overweight U.S. population. However, these products could be unsafe to use due to adulteration with prescription drugs. Depending on patients’ health conditions, these products can lead to unexpected adverse reactions. These adulterated products are readily available online with little government regulation and intervention, putting the public at risk.

Compounding Laboratory Exercise in Ointment Making. 

Anna Kochanowska Karamyan, Texas Tech University Health Sciences Center.

Objective: The aim of this project was to create and implement a laboratory exercise in ointment making to compare traditional, ointment slab using technique with a modern approach using automated equipment in a number of qualitative and quantitative measures. 

Methods: In a setting of a compounding laboratory course, first year PharmD students prepared an ointment using two methodologies, traditional ointment slab and unguator. Compounded ointments were compared based on organoleptic characteristics (physical appearance, color, texture and signs of phase separation), homogeneity, stiffness, grittiness (evaluated by immediate skin feel and analysis in ImageJ platform) and spread-ability (assessed by spreading diameter of 1 g of sample between two glass plates 1 minute after applying a standard weight to the top plate). The period required to prepare the ointment by both methods was also measured. 

Results: Analysis of 70 samples showed that the ointments compounded utilizing unguator had substantially better characteristics, including spread-ability, grittiness and homogeneity (p<.05). The average time used to make the ointment was 18 minutes for unguator and 50 minutes when utilizing ointment slab (p<.05). 

Conclusions: The modern approach utilizing unguator proved to be superior to the traditional method and resulted in ointments with substantially better overall characteristics, in a shorter period of time. In addition to exposing students to both ointment preparation techniques, this laboratory exercise provided opportunity for learners to review and practice quality control requirements for compounded ointments.

Design of Student-Driven Pharmaceutics Laboratory Teaching Model Focusing on Problem Solving Skills Using Patient-Care Case Studies 

Hemachand Tummala, South Dakota State University, Akash Mehta. 

Objective: The objective of this work is to design and assess a novel teaching model that fundamentally changes the laboratory training from recipe-cook book style to open-ended problem-solving model using patient-case studies: Patient-Oriented, Problem-Solving, Inquiring, Co-operative Learning (POPSICL). The core competencies that are the focus of this model include problem-solving, critical thinking and innovation. 

Methods: Student groups were provided with a pharmaceutics-based patient case study to solve without any formula provided. Instead, they were trained in problem-solving skills. The students were expected to identify the problem, collect the necessary information, critically analyze the data, create, and execute the plan, and assess the final outcome. In the laboratory, they interacted extensively with peers and the instructor(s) posed relevant inquiries to guide them through the process, which makes POPSICL a co-operative learning model, where each student learns from his own exercises and also from peers and instructor(s). 

There is no one answer to the case study. No points are deducted for a failure. However, the points are earned for active participation and reflective thinking. The model is implemented and assessed at the beginning/end of the course through perception surveys, quizzes, and problem-solving exercises. 

Results: The model has been received positively by the students: 85.45% of students better understood the pharmaceutics principle after the course; 81.2% practiced critical thinking skills
Development and Evaluation of Paclitaxel Nano-emulsion for Cancer Therapy

Sara Shakhwar, Chicago State University College of Pharmacy, Rana Darwish, Chicago State University College of Pharmacy, Sami Malovski, Chicago State University College of Pharmacy, Adnan Restum, Chicago State University College of Pharmacy, Temitope Oni, Chicago State University College of Pharmacy, Sami M Nazzal, Texas Tech University Health Sciences Center, Ahmed Abu Fayyad, Chicago State University.

Objective: The objective of this work was to prepare and evaluate a nanoemulsion formulation for paclitaxel using a new tocotrienol-based drug delivery system. Methods: Paclitaxel nanoemulsion was prepared by solvent evaporation method. Paclitaxel, tocotrienol oil and the tocotrienol derived surfactant into were weighed into a glass vial and solubilized with 0.5 mL dichloromethane. The sample was vortexed vigorously and the solvent was removed by flushing with N2. Preheated distilled water was then added to each vial, and the samples were briefly vortexed and then subjected to 5 min sonication using an ultrasonic homogenizer. The resultant nanoemulsion was characterized for its particle size, zeta potential, entrapment efficiency, stability and in-vitro anticancer activity. Results: After propensity score matching (N=442), ticagrelor and clopidogrel had no significant difference in MACE, re-hospitalization and bleeding. The decision tree analysis showed that the number of diseased vessels modulated the effect of ticagrelor and clopidogrel on re-hospitalization rates. In single-vessel disease (SVD) patients, ticagrelor was associated with lower hazards than clopidogrel for all efficacy endpoints: MACE (HR=0.190, 95% CI: 0.042-0.866), re-hospitalization (HR=0.296, 95% CI: 0.108-0.808), urgent re-PCI (HR=0.249, 95% CI: 0.069-0.895), bleeding (HR=1.006, 95% CI: 0.063-16.129). However, in multi-vessel disease (MVD) patients, the two treatments did not show significant difference. Conclusions: In the general patient population, there was no significant difference between ticagrelor and clopidogrel on the hazard of MACE. However, ticagrelor achieved a better efficacy than clopidogrel in patients with SVD. This study provides scientific basis to call for a large-scale prospective study in this population.

Feasibility Study of Storing Mannitol at a Higher Temperature to Prevent Crystallization


Objective: Mannitol is an osmotic agent used in emergency settings to decrease intracranial pressure after head trauma. When stored at room temperature mannitol crystallizes, but at higher temperatures (above 36°C) it dissolves and remains in solution form. Therefore, storage of mannitol solution at a higher temperature can prevent its crystallization. However, the stability of mannitol at higher temperatures is unknown. The objective of this project is to determine the stability of mannitol solution when storing at 37°C. Methods: Mannitol formulation (25% mannitol injection, USP), was stored at 37°C in an incubator and periodically tested in terms of physical appearance and concentration. The concentrations of mannitol solutions were determined using HPLC coupled
with an evaporative light scattering detection (ELSD). The separation was carried out using a Luna® Omega 3 µm Sugar LC column using 80% acetonitrile as mobile phase (1 mL/min). Sucrose was used as the internal standard. Results: Mannitol and sucrose chromatograms were well resolved under the current HPLC conditions without any noticeable interference from the solvent or other ingredients with the retention times of 11.3 and 16.3 min, respectively. There was no significant change in the physical appearance by visual check. The average deviation in terms of the amount of mannitol of each time point was less than 2.37% for a 4-month period. Conclusions: The results indicated that mannitol was stable at 37°C for at least 4 months. These results show that mannitol solution can be stored at 37°C rather than room temperature to effectively avoid crystalization.

Genome-Wide Association Study of Clopidogrel in Caribbean Hispanics.

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Objective: High on-treatment platelet reactivity (HTPR) with clopidogrel is predictive of ischemic events in adults with coronary artery disease. Despite strong data suggesting HTPR varies with ethnicity, clinical and genetics, no pharmacogenetic studies of clopidogrel have been performed in Caribbean Hispanics. This study was aimed to identify genetic predictors of HTPR in a cohort of cardiovascular patients from Puerto Rico. Methods: A genome-wide association study (GWAS) was conducted in 530 patients on clopidogrel. Patients were separated into cases (HTPR) and controls (no-HTPR). Platelet function was measured by VerifyNow® P2Y12 assays and HTPR defined as P2Y12 reaction units (PRU) ≥230. Genomewide screening was performed using Illumina MEGA-chip array and further genotyping of candidate genes (eg, CYP2C19, ABCB1, PON1) was performed by Taqman® Assays. Plink was used to test for associations and LD analyses. Results: Manhattan plot showed suggestive signals of associations at nominal significance (p<10-7) between CYP2C cluster at chromosome 10 and resistance in the discovery cohort. Pairwise analysis of identified variants showed strong LD of SNPs at this cluster with the CYP2C19*2 allele (D’>0.9; r2>0.8). A novel African-related variant rs187781 at chromosome X needs further validation. Multiple logistic regression showed that 27% of PRU variation was explained by history of diabetes (OR=3.46), hematocrit (OR=0.75), CYP2C19*2 (OR=4.44) and PON1Q192R alleles. Notably, larger incidence rate of major adverse cardiovascular events (MACEs) in patients with higher PRU was also found. Conclusions: This is the first GWAS report of clopidogrel pharmacogenetics in Hispanics, confirming the relevance of CYP2C cluster. Diabetes mellitus, hematocrit, CYP2C19*2, and PON1 Q192R variants were associated with HTPR, which may identify Hispanic patients at higher risk for adverse events.

Machine Learning Algorithm for Predicting Warfarin Dose in Caribbean Hispanics Using Pharmacogenetic Data.

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Objective: Despite some previous examples of a successful application in the field of pharmacogenomics, the utility of machine learning techniques for warfarin dose predictions in Hispanics has yet to be fully evaluated. This study is aimed at the comparison of seven machine learning methods to predict stable warfarin dosing in Caribbean Hispanics. Methods: This is a secondary analysis of data from a retrospective cohort study (NCT01318057). Participants were recruited from an anticoagulation clinic in San Juan, Puerto Rico. Several machine learning methods were applied to the data. Data were divided between 80% and 20% to train the predictive models. Model performance was determined using the mean absolute error (MAE) and the percentage of patients whose predicted dose were within ±20% of the actual stabilization dose. Performance metrics were compared across different dose ranges. Results: Random forest regression (RFR) outperformed all other methods, with MAE of 4.93 mg/week and 80.6% of predicted doses within ±20% of the ideal dose. Among those with normal dosing requirements, RFR performance was better than the rest of the models as denoted by MAE of 2.91 mg/week (2.18-3.64) and 100% of predictions within ±20%. In the sensitive sub-cohort, both support vector regression (SVR) and RFR showed superiority over the others with lower MAEs (5.58-7.17 mg/week) and higher predictability (ie, 50.0% and 62.5%, respectively). Finally, multivariate adaptive regression splines (MARS) showed meaningful results in the resistant subcohort, with MAE of 7.22 mg/week and 66.7% of predictions. Conclusions: Models generated by using the RFR, MARS and SVR...
methods showed significantly better results in predicting warfarin doses as compared to the others. Differences in model performance between normal, sensitive or resistant patients were also found.

**Measuring Student Engagement in a New Online Introductory Pharmaceutics Course**


**Objective:** Identify the relationship between level of student engagement and academic performance in the initial offering of an online pharmaceutics course.

**Methods:** A 3-credit online course in pharmaceutics was offered for first-year students within a 7-week instruction block. An online engagement target of 19.5 h/wk was set using a standard scaled credit-hour definition. Day-to-day pacing was provided to students, with introductory videos highlighting course design/alignment. A detailed communication plan reinforced daily activity sequences for completing course objectives. Regular, low-stakes, focused assessments aligned with learning objectives were utilized with weekly deadlines to incentivize timely completion. Level of student engagement was measured by tracking weekly cumulative time spent utilizing course resources (reported via learning management system) over the 7-week block. A Pearson coefficient was used to correlate engagement and academic performance for the whole class, while levels and patterns of engagement were compared between upper/lower quartiles of the final grade distribution using t-test and Chi-square (significance p < 0.05).

**Results:** Student data from the initial offering (n = 28) were captured, with mean engagement marginally exceeding the course target (19.66 +/- 9.04 h/ wk/student). Weekly online engagement with course resources showed moderate positive correlation with final grades (r = 0.545). Online weekly engagement was significantly higher for students performing in the upper quartile (26.46 +/- 8.47 h/wk) compared to the lower quartile (14.46 +/- 7.05 h/wk) (p = 0.007). Additionally, 86% of students in the upper quartile exceeded the weekly engagement target, compared to 29% of students in the lower quartile (p = 0.03).

**Conclusions:** More regular student engagement generally correlated with better course performance. The best performing students exceeded the target online engagement value more frequently than students whose course performance fell in the lower quartile.

**Stability of Cefovecin Sodium (Convenia) Stored Off-Label in Veterinary Clinical Practice**


**Objective:** Cefovecin sodium (CS; Convenia) is a long-acting third-generation cephalosporin used to treat canine and feline skin and tissue infections. The drug product is available as a lyophilized powder for reconstitution which, according to the package insert is stable for 56 days stored under refrigeration. However, it has been clinically observed that, due to high costs, veterinary practitioners frequently store the reconstituted product under off-label conditions. The purpose of this study is to analyze the stability of CS stored at -20°C under various packaging and storage conditions for up to one year in order to inform clinical veterinary practices.

**Methods:** Reconstituted CS (80 mg/mL) was aliquoted into unit dose plastic syringes (PS) or glass vials (GV), and multidose glass vials (MDV) then stored frozen (-20°C), refrigerated (4°C), or at room temperature for up to 56 weeks. Samples (diluted 1:4) were analyzed bi-weekly in triplicate via HPLC. Sample concentration was calculated against a calibration curve (20 – 40 mg/mL) and compared to baseline (day 0) concentration.

**Results:** CS maintained 90% initial concentration when stored frozen in PS, GV, and MDV for up to 30 weeks, which is consistent with FDA guidelines (FDA-CVM, 21 CFR 514.1). There was no apparent effect of multiple freeze-thaw cycles on drug stability. CS was stable for only 2 weeks when stored at room temperature but up to 8 weeks under refrigeration, which is in line with the package insert.

**Conclusions:** Our data suggests CS may be stored frozen in order to extend the physical-chemical stability of the drug. However, further studies are needed to assess the effect of long term storage on the efficacy of CS.

**Tracking Longitudinal Performance of P4 Pharmacy Students in “PassNaplexNow” Assessments**


**Objective:** To demonstrate if practice knowledge gained in APPEs results in improved student performance in “PassNaplexNow” assessments.

**Methods:** The College of Pharmacy has contracted with PassNaplexNow Inc., to prepare student pharmacists as “practice-ready graduates” in preparation to passing the NAPLEX. In addition, to live lectures and videos, all P4 students are required to complete online assessment modules in an open-book format in the vendor platform during APPEs. The students must obtain a passing score of seventy percent on these assessments to pass each APPE rotation. The students have the opportunity to take “PassNaplexNow” assessments multiple times in order to record the passing score.
The most recent score is considered for grading purposes. Online examination questions mirror NAPLEX question styles and cover a plethora of topics that align with licensure competencies. **Results:** Mean student scores (% percent items) from the last two attempts of these modules in the first five rotational blocks indicate that scores increase significantly for all twenty-nine topic areas for the most recent attempt. Paired t-test analysis has confirmed that the increases are statistically highly significant (P < 0.001) for twenty-eight sections. Highest average % increase in student scores for two attempts are exemplified for “Math (Part B) (72.5)” followed by “Herbals & OTC (69.4)”, “Acute Coronary Syndrome (62.9)” and, “Tuberculosis (62.8)” sections. The lowest increase is noted for “Anxiety, Depression and Bipolar Disorder (34.6).” Scores equal to or greater than the passing threshold are attained for most areas in the latest effort. **Conclusions:** Our limited study indicates that student participation in APPE activities has led to enhanced critical thinking skills and application knowledge resulting in better student scores in this appraisal measure.

**Using Text Mining to Identify Key Skills and Characteristics of Jobs for PhD Graduates**

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**Objective:** The purpose of this study was to analyze job descriptions from two areas identified as emerging opportunities for PhD students at the UNC Eshelman School of Pharmacy. **Methods:** In 2019, 206 job descriptions were sourced from web-based job advertisers using search phrases related to Biologics (eg, Protein Structure, Gene Therapy, Antibodies) and Drug Modeling/Simulation (eg, Pharmacometric, Drug Simulation, Pharmaceutical Modeling). Demographic data was extracted (eg, location, company type, degree requirements). The remaining text was mined using the R-based “Bag of Words” program. Two reviewers independently categorized words as technical skills or professional skills, and disagreements were resolved by a third reviewer. Categorical data are presented as frequency(percent). **Results:** A total of 18,550 words were mined from 128 biologics descriptions and 20,439 from 78 modeling/simulation descriptions. Most jobs were for biotechnology/pharmaceutical companies (n = 88, 68.75% for biologics; n = 54, 69.23% for modeling/simulation) in Massachusetts (n = 40, 31.25%; n = 31, 39.74%) and California (n = 34, 26.56%; n = 17, 21.79%). Biologics jobs most commonly considered PhD graduates from biochemistry (n = 69, 53.91%), molecular biology (n = 46, 35.94%), and engineering (n = 39, 30.47%) while modeling/simulation jobs most commonly considered graduates from pharmaceutical sciences (n = 53, 67.95%) and engineering (n = 32, 41.03%). Biologics had 72 words classified as technical skills and 34 as professional skills, while Modeling/Simulation had 77 words classified as technical skills and 36 as professional skills. The top 5 professional skills for biologics were collaboration, support, communication, manage, and lead while the top 5 for modeling/simulation were collaboration, support, strategy, communication, and plan. **Conclusions:** Specializations in pharmaceutical sciences, such as biologics and modeling/simulation, compete against various disciplines and require varied skills for employment. Additional research is needed to determine how we might best recruit, train, and position students for success in these fields.

**Validation of an Improved Reversed-Phase HPLC Stability-Indicating Method of Curcuminoids**

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**Objective:** Curcumin, a common spice obtained from turmeric root, is found to have multiple therapeutic properties including anticancer, anti-inflammatory, and anti-bacterial effects. The objective of the current study is to validate an improved stability-indicating Reversed-Phase HPLC method developed to detect and quantitate curcumin, its impurities and degradants. **Methods:** The chromatographic system included Hitachi Elite LaChrom Organizer with PDA detector. Isocratic separation was achieved with 40% (v/v) Acetonitrile-60% (v/v) water-0.1% (v/v) TFA using Phenomenex Synergy Max-RP column, column temperature 45°C in 20 min run time. Analytical method validation parameters included LLOD, LLOQ, linearity, range of detection, system suitability, interday/intraday accuracy and precision, robustness and ruggedness. System suitability parameters included resolution, %RSD, number of theoretical plates, capacity factor and tailing factor. Robustness was studied using fractional factorial design with flow rate, %organic, column temperature and pH as variables affecting system suitability and retention time. **Results:** Curcumin and impurities, demethoxycurcumin and bisdemethoxycurcumin, were detected and resolved at 13.65, 11.53 and 12.25 minutes, respectively. LLOD and LLOQ were 0.390 and 1.56 mcg/mL, respectively; range of detection was 0.390-250 mcg/mL; linearity was 0.390-250 mcg/mL; intraday and interday accuracy and precision ranged from 0.137-0.913% and 0.137-2.973%, respectively. System suitability parameters such as resolution, %RSD, number of theoretical plates, capacity factor and tailing factor were found to be 2.72,
Methods: Investigators developed an online questionnaire aimed at identifying the various characteristics of pharmacy law curricula at the 142 AACP member institutions in September 2018. Unique links were sent via email to the respective pharmacy law educator (or associate dean if no pharmacy law educator was identified) at each institution. The questionnaire used branching logic based on respondents’ answers in order to avoid presenting irrelevant questions to the user. Follow up requests were sent to non-responding institutions, with data collection closed in April 2019. Descriptive analyses were performed. This study received Institutional Review Board approval from Keck Graduate Institute. Results: A total of 97 member-institutions completed the questionnaire yielding a survey response of 68.3%. Data indicates significant variations across respondent-programs with respect to the professional background of pharmacy law instructors, assessment strategies used in pharmacy law courses, as well as the structure and timing of the core pharmacy law course within the PharmD curriculum. Conclusions: Pharmacy law content and its place in the curricula is not consistent across the surveyed institutions. These results point to a continuing need for further investigation to identify best practices that would inform pharmacy educators and improve students’ understanding of the law.

A Longitudinal Interprofessional Education/Practice (IPE/IPP) Project Designed to Increase IPE/IPP Awareness and Communication Skills
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Objective: To demonstrate an increase in the awareness of Interprofessional Education/Practice (IPE/IPP) foundational components and in particular, an improvement in communication skills among first-year pharmacy students via a novel longitudinal project. This activity contributes to a robust fulfillment of ACPE standards 3 and 11 regarding interprofessional education and practice. Methods: Students were grouped according to leadership domain categories using StrengthsQuest data. They were then tasked with developing an interprofessional communication model involving pharmacy and a randomly assigned health-care profession that incorporated both the pharmacist patient care process and the interprofessional education collaborative (IPEC) core competencies. Project milestones included a general outline, interview summary, white paper, IPE provider panel and poster presentation. The Interprofessional Collaborative Competencies Attainment Survey (ICCAS) was utilized to capture statistical data to ensure curricular validity and value. Results: The ICCAS tool was administered both pre- and post-project completion in the Fall 2019 semester. The subsequent data was then compared using a paired t-test analysis with statistical significance set at \( p < .05 \). The results were as follows: \( t = 16.539938, p < .00001 \). The result is significant at \( p < .05 \). ICCAS questions 1-20 were mapped to the IPEC sub-competencies. The final question on the ICCAS tool is qualitative in nature with 27 out of 29 reporting an increase in collaborative abilities. Conclusions: This longitudinal IPE/IPP communications project has proven itself to be of paramount value in enhancing first-year pharmacy students IPEC core competency skills while engaging other professions and promoting strong, innovative communication models for future collaborative practice. Further analysis will allow for specific sub-competency strength identification which may assist in curricular planning and development.

A Modified Delphi to Define Essential Skills for Pharmacy Graduates
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Objective: To define essential skills for graduates needed in the four most common sectors of pharmacy practice as determined by expert pharmacy skills laboratory faculty. Methods: A three-round Delphi method was used to establish consensus. Fifteen faculty participated on the
expert panel. In the first round, participants were asked what skills were needed by students at entry to practice in community, health-system, ambulatory care, and managed care pharmacy settings. In rounds two and three, participants were asked to rate each skill with a level of importance using a 10-point Likert scale (1 = not important to 10 = very important). Results: In round one, participants (N = 15; RR = 93.3%) produced a collective list of 289 essential skills. These skill statements were sent to participants (N = 15; RR 93.3%) in rounds two and three to assign a level of importance. After the third round, participants (N = 15; RR 80%) reached consensus using a mean level of importance for a final list of 69 community pharmacy skills, 47 health-system, 60 ambulatory care, and 15 managed care skills. These skills were then mapped to Entrustable Professional Activities domains for colleges/schools of pharmacy to use as a resource when assessing core competency development in the curriculum. Conclusions: The Delphi process was successful in identifying essential skills graduate pharmacists should have prior to entering community, health-system, ambulatory care, or managed care pharmacy practice. Findings show that a large number of skills should be developed in students through the didactic curriculum to prepare students to enter practice and the essential skills lists may help curriculum committees to prioritize learning opportunities and the allocation of resources for skills laboratories.

An Innovative Curriculum Integrating Statistics and Study Design with Core Sciences in a Thematic Block

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Objective: Critical appraisal and application of drug therapy literature are key knowledge-based skills in pharmacy practice. Based on student course evaluation and performance, it was not well-integrated into the first iteration of the Cardiovascular Sciences and Therapeutics, a Doctor of Pharmacy thematic block, in 2018. This study aimed to develop, implement, and evaluate a curriculum that better integrated epidemiology, statistics and study design content with core sciences content (eg, therapeutics) in the thematic block. Methods: We developed and implemented a second iteration curriculum, which integrated epidemiology, statistics and study design with core sciences content in a more systematic way, focusing on learning by application and practice. We administered an online survey questionnaire to assess students’ perceptions of the second iteration curriculum at the end of the course in 2019. Since there were three questions on summative assessments that were administered to both the 2018 and 2019 cohorts, we compared the pass rate for each question between the two cohorts using a chi-squared test. Results: Out of 127 students enrolled, 120 (94%) responded to the survey. Over 80% of respondents agreed or strongly agreed to good integration, effective organization and sequence, and helpful application materials in the 2019 curriculum. The 2019 cohort had a significantly higher pass rate in two out of the three summative exam questions when compared to the 2018 cohort (86.6% vs. 75.8%, p = .037; 70.9% vs. 48.4%, p = .0013, respectively). Students identified additional practice opportunities and early communication on a final project as areas for improvement. Conclusions: The 2019 curriculum was received favorably by students and appeared to be more effective than the 2018 curriculum in student learning.

An Interprofessional Education Event as an Innovative Method to Improve Pharmacy Student Opioid Education

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Objective: To use an interprofessional (IPE) case-based event to improve pharmacy student knowledge of the opioid epidemic and to improve communication and collaboration between professions. Methods: An interprofessional case-based event was delivered in 2018 and 2019, including a total of 332 students in the second year of their respective professional degree programs (n=97 pharmacy, n=90 medicine, and n=145 nursing). Students were split into balanced teams of 10-12 students, including representatives from each profession. Each team worked collaboratively on a patient case of progressive difficulty with complications revolving around opioid abuse, medical costs, and drug diversion. Didactic education was also provided, reviewing the roles of various healthcare providers in the opioid epidemic as well as current legal requirements of the state. Anonymous, matched pre and post surveys (4-point Likert scale) were provided to the students to assess the effectiveness of the event. Students self-reported their level of agreement to seven IPE statements mapped to the event objectives and IPEC competencies. Results: A non-parametric Wilcoxon signed-rank test showed improvement in all seven...
An Interprofessional Opioid Education Training Focused on Providing Team-Based Care

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Objective: To develop an interprofessional education (IPE) training session for health science students focused on providing team-based care when managing the complex needs of patients who take opioids. Methods: A two-hour IPE training session was designed for students from pharmacy, medicine, nursing, social work, and addiction studies programs that uses an unfolding video case of a patient with chronic pain and potential opioid use disorder. Over 300 students participated in the training. Student teams worked together to identify roles and responsibilities, to assess the patient, to develop a treatment plan, and to practice use of non-stigmatizing language. Baseline knowledge, student attitudes toward IPE, and perceptions of the training were collected through anonymous pre- and/or post-surveys and compared among learners. Quantitative data was analyzed using ANOVA with Tukey’s multiple comparisons test. Qualitative data was evaluated for thematic findings. Results: Differences in baseline knowledge between the student professions was evident with pharmacy students performing statistically better than social work students but worse than medicine students (p<0.05). Statistically significant differences (p<0.05) between professions were seen in student IPE attitudes with social work and addiction studies students reporting the highest value and medicine students reporting the lowest. Following participation in the training, 76% of participants agreed/strongly agreed with the statement, “I better understand my role and the roles of other healthcare team members in providing care to patients who use opioids.” Qualitative data indicated students valued interacting with students from other disciplines and working together to develop treatment plans. Conclusions: The opioid education IPE training provides a unique IPE opportunity for students to practice coordinated care. It is available for other institutions to adapt and utilize.

Assessing Student Pharmacists’ Readiness for Management and Examining Pharmacy Managers’ Perception of Important Responsibilities

Jason Wong, Western University of Health Sciences, Kevin Mancilla, Lin Aye, Patrick Li.

Objective: As pharmacy is becoming more value-based and cost-driven, the profession is under increasing pressure to maximize the return of resources while improving pharmacy management. Therefore, it is paramount for pharmacy management education to mirror today’s practice environment. This study’s objectives are to measure the readiness of fourth year student pharmacists to take on different Pharmacist-In-Charge (PIC) responsibilities and examine pharmacy preceptors’ perception of important management responsibilities for student education. Methods: Part 1 of the study surveyed the readiness of students to assume a management position through a 25-question survey, before and at completion of a two-day PIC lecture series, to gauge improvement and readiness of their managerial knowledge. Part 2 surveyed PICs using parallel questions. Highest and lowest average rankings are used to identify managerial items each group valued the most and the least. Results: Both students and preceptors felt students at graduation were unprepared to manage pharmacies. Students expressed moderate confidence throughout the majority of management tasks. The study identified how the profession focuses on high-risk management responsibilities such as controlled substance management, risk management during pharmacists’ absence, and HIPPA, but little focus on staff management. Conclusions: While preceptors identified management responsibilities covered in the PIC week curriculum as important, student pharmacists also reported improved mastery of these areas at completion of the program. There is room for further management training to be implemented in the curriculum. Further assessment will be done to better integrate foundational management concepts into the PharmD curriculum.

Assessing the Impact of an Interprofessional Education Activity on Student Attitudes in a Mock Pharmacy

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**Objective:** To describe the impact of a large cohort interprofessional education (IPE) activity on change in the Interprofessional Attitudes Scale (IPAS) in P3 pharmacy students. **Methods:** In a mock pharmacy laboratory, 2nd year physician assistant (PA) students (n = 100) evaluated infectious disease cases to formulate a diagnosis, treatment plan, and produce a prescription to present to P3 Pharm.D. students (n = 285). This activity was intended to provide an opportunity and environment for Pharm.D. and PA students to learn about and from one another, as members of a healthcare team. Students collaborated in interprofessional groups to resolve clinical issues to provide optimal patient care. The IPAS survey was administered to Pharm.D. students before and after the IPE simulation activity to evaluate changes in attitudes resulting from the activity. Data were analyzed by grouping the IPAS survey into domains, using a Wilcoxon signed-rank test, along with qualitative data from free-text responses from participating students. **Results:** A total of 106 Pharm.D. students completed both the pre- and post-event surveys (37.2% response). There was an improvement in the median score in the following IPAS domains: Teamwork, Roles and Responsibilities (p = 0.006), and Patient-centeredness (p = 0.02). In general, Pharm.D. students were appreciative of the interaction with PA students, including understanding the thought process of writing a prescription, and education for PA students and potential medication errors. **Conclusions:** In this IPE activity involving Pharm.D. and PA students, Pharm.D. student feedback for this event was generally positive, with a statistically significant increase in two IPAS domains. Future directions include incorporating Pharm.D. students more in the case evaluation process and evaluating the IPAS for PA students.

**Assessing the Impact of a Transitions of Care Elective Course on PharmD Students**


**Objective:** To assess students’ knowledge and perceptions of the transitions of care (TOC) pharmacists role and the impact of a TOC elective course on post-graduate career planning **Methods:** Third year PharmD students (n = 25) were enrolled in the two-credit TOC elective course. The course was designed to include relevant TOC concepts and utilized interactive in-class exercises, patient cases, simulations, student presentations, and application of the Pharmacists’ Patient Care Process (PPCP). TOC clinical pharmacists from diverse health settings were invited as guest lecturers to share their patient care experiences. A pre-assessment and post-assessment survey were distributed at the beginning and end of the course by a staff administrator to eliminate survey bias. Students were asked to anonymously respond to 9 survey questions using a five-point Likert scale (ie, strongly disagree = 1, strongly agree = 5). **Results:** 92% (n = 23) PharmD students responded to the pre- and post-assessment survey, which were subsequently analyzed. Culminate responses indicate statistically significant responses to 8 of 9 questions regarding improvement in students’ knowledge of TOC concepts and pharmacists’ role, communication skills, and confidence in providing comprehensive patient care (p < 0.005). There was a positive trend in improving interest in pursuing additional training opportunities, such as post-graduate residency or fellowship training (p = 0.133). **Conclusions:** The TOC elective course provided an opportunity to PharmD students to learn about the TOC pharmacists’ role, improve knowledge of TOC patient care process, develop practical skills, and engage with clinical pharmacists. Future studies may be of interest to assess performance on TOC experiential rotations and post-graduate training or career choice.

**Assessing the Impact of Standardized Patient Encounters on Students’ Medical History-Taking Skills During a Community IPPE**

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**Objective:** At LIU Pharmacy, medical history-taking has traditionally been taught in a P1 physical assessment course (PHM 326) using peer role-play and weekly virtual patient activities. In 2018, our research using an unannounced standardized patient (SP) revealed that students did not adequately transfer these skills acquired in PHM 326 into practice. We sought to investigate whether incorporating SP encounters in the course would improve students’ ability to take a medical history during a community introductory pharmacy practice experience (IPPE). **Methods:** In spring 2019, three SP encounters were added to PHM 326; a group and two one-on-one encounters, the final being a summative assessment. As in 2018, during the summer 2019 community IPPE an unannounced SP used a 17-item
Assessment of Co-Curriculum Knowledge, Attitude, and Perception Among Pharmacy Students

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Objective: To evaluate pharmacy students’ knowledge, attitudes and perceptions on co-curriculum activities (CCA) at Touro College of Pharmacy (TCOP) Methods: A survey was developed and administered to all first year through fourth year pharmacy (P1-P4) students. The instrument consisted of 14 questions on participants’ baseline demographics and knowledge about CCA and 37 positively and negatively stated questions about students’ attitudes and perceptions towards CCA using a Likert-type scale. All questions were evaluated using descriptive statistics. Results: Of the 245 students invited to participate, 112 (46%) responded. Eighty percent were aware that CCA is a required ACPE standard and 97% were aware of the specific requirements of the CCA at TCOP. Majority of students believed that CCA helped with their professional and personal growth and led to a deeper understanding of the pharmacy profession, with P1 and P2 (89%) students being more likely to agree with these statements. Less than 40% of students felt that CCA had an impact on their personal career path or academic performance. Sixty percent of students enjoyed participating in CCA, however, P4 students were not concerned with the quality of CCA and found doing CCA every semester pointless. Fifty percent of students reported spending two to six hours per semester on activities, which they believed to be excessive. Students felt supported (76%) by the college when conducting CCA. Less than 50% stated that they received consistent feedback about CCA reflections. Conclusions: Students were aware of the co-curricular requirements and majority believed CCA have led to their professional growth and better understanding of the profession, but feel the requirement is burdensome. Consistent feedback on co-curricular reflections should be encouraged to reinforce the importance of CCA.

Assessment of Drug Utilization Review Activities Within US Colleges of Pharmacy

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Objective: Limited literature exists regarding current practices in teaching and assessing drug utilization review (DUR) skills in pharmacy colleges/schools. The objectives of this study were to: 1) Examine whether and how assessment is conducted for drug utilization review (DUR) activities, and 2) Summarize the assessment strategies of DUR activities via analysis of rubrics/checklists in colleges of pharmacy. Methods: A web-based survey was administered to members of the American Association of Colleges of Pharmacy (AACP) Laboratory Instructors Special Interest Group via email. Descriptive statistics were used to evaluate survey results and the assessment tools (ie, rubrics/checklists) collected were analyzed qualitatively to determine common content areas. Results: Out of the 60 responses, 34 (57%) were complete and represented individual colleges which both implemented and assessed DUR activities. Forty-one percent of institutions utilized one general rubric/checklist throughout the entire curriculum. The majority (62%) used the assessment tool in the first professional year, with a preference for a paper rubric/checklist (74%). Eighty-two percent of participants developed the rubric/checklist within their own institution. ‘Identification of drug related problems’ (97%) and ‘Determination of the pharmacist’s action’ (85%) were listed as important components of the rubric/checklist. Identified strengths of the institution’s rubric/checklist included ease of use (55%) and adequate assessment of students’ knowledge/skills (55%). A validated assessment tool (85%) and inclusion of technology (50%) would improve the delivery of student feedback. Conclusions: Wide variability existed in whether and how schools incorporated and assessed DUR activities. Developing a standardized method of teaching and assessing DUR is important to adequately prepare the next generation of pharmacists.
Assessment of Faculty Perceptions of Implementation of the Longitudinal Skills Lab Courses in PharmD Curriculum
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Objective: This study was designed to assess faculty perception of implementation of the longitudinal skills lab course(s) in the PharmD curriculum in schools and colleges of pharmacy in The United States. Methods: IRB-approved quantitative analysis of data collection using web-based questionnaire administered via SurveyMonkey. This 5-minute survey is designed to gather information regarding faculty perceptions of implementation of the longitudinal skills lab in a PharmD curriculum. All responses are collected anonymously and in aggregate. Data was analyzed using SurveyMonkey’s analytics. Results: Results show that total of 64 participants who completed the survey (out of 67) reported that skills lab course(s) is/are included in their institutions’ curriculum. Majority of participants (73%) reported that skills lab has had an impact on their workload. Despite the increase in faculty workload, majority of participants (79%) felt that skills lab course(s) improved students’ overall performance. In addition, 76% of participants recommend that skills lab continue to be offered in the curriculum. Conclusions: The results of this study provide an assessment of faculty perception of implementation of the longitudinal skills lab course(s) in the PharmD curriculum. Majority of faculty indicated that skills lab course(s) were offered in their curriculum and had a positive impact on students’ performance, despite increased workload. The results of this study helped evaluate the purpose and goals of the longitudinal skills lab implementation.

Assessment of First Year Pharmacy Student Pre-APPE Skill Development in a New Skills Lab Course
Stephanie Hunziker, Southern Illinois University Edwardsville, Miranda J. Wilhelm, Southern Illinois University Edwardsville.

Objective: To assess development of pre-APPE domain skills in first year pharmacy students utilizing performance-based assessments (PBAs). Methods: Students enrolled in the first semester of a new pharmacy skills lab course sequence practiced community-pharmacy related skills for several weeks, which culminated in a PBA designed to assess skills related to pre-APPE domains (1,3,4). The PBA consisted of two parts: prescription transcription and error identification (domain 1); and a combination of stations including prescription verification and identification of drug related problems. (domains 1, 3, 4). Students were required to pass both parts, and these scores were pre-determined based on minimum competencies. Results: Eighty-two first year pharmacy students completed the PBA in fall 2018 and seventy-four in fall 2019. In fall 2018, 96% (n=78) achieved pass on the first attempt on parts one and two; 4% (n=3) received no pass on part two. In fall 2019, 92% (n=68) passed both PBA parts 5% (n=4) did not pass part one, and 3% (n=2) did not pass part two. In both groups, students who did not pass on first attempt achieved passing scores during remediation opportunities following feedback and review sessions with course faculty. Conclusions: This study establishes that first year pharmacy students in a new pharmacy skills lab course are successfully developing pre-APPE domain skills specific for the course, as demonstrated by PBA results in the first two years. Assessing pre-APPE domains early in a pharmacy skills lab course assists in development of pre-APPE domain skills in future courses, ensuring students are adequately prepared for APPEs. Plans for future studies include evaluation of pre-APPE domain skills as students advance in skills lab courses and assessing student perceptions of skills achievement.

Assessment of Student Knowledge and Confidence of Infectious Disease Point-of-Care Testing Following a New Skills Practicum
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Objective: Assess student pharmacists’: (1) confidence and knowledge in performing infectious disease (ID) point-of-care testing (POCT) before and after a practicum; (2) ability to develop appropriate treatment plans for associated diseases. Methods: A new two-hour practicum was implemented in Fall 2019 in a required ID course for third professional year students. Students were required to demonstrate appropriate technique for oral and nasal swabs and complete case scenarios about penicillin allergy testing and appropriate treatments for strep throat, influenza, tick bites, and Lyme’s disease. Facilitators led a debrief at the end of the session to emphasize important concepts. Students completed a pre- and post-survey that assessed their confidence and knowledge in completing ID-POCT and a knowledge-based assessment on the associated diseases. Results: Students’ ability to make appropriate treatment recommendations improved by 12% from the pre-survey to the post-survey. Student comfort in performing and interpreting the POCT significantly improved as a result of the practicum session. However, there was no correlation between comfort level in performing a POCT and students’ ability to choose the correct treatment regimen for that disease. Most students (95%) found the practicum beneficial, and 100% of
students found the practicum format conducive to learning. **Conclusions:** Following this skills practicum, student pharmacists displayed increased comfort in testing, interpreting, and recommending treatment for specific infectious disease topics, and increased competence in treating these diseases appropriately. Implementing these important ID-POCT skills into pharmacy curricula is necessary to prepare learners for the growing trend of pharmacists practicing in innovative and more independent settings nationally.

**Attitudes of Pharmacy and Nursing Faculty Towards IPE Readiness**
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**Objective:** The purpose of this study was to examine the readiness of faculty members towards interprofessional teamwork with a new addition of the PharmD program in the existing nursing program at the university. **Methods:** The Readiness for Interprofessional Learning Scale (RIPLS), developed by Parsell and Bligh was used to assess the attitudes of faculty members regarding IPE. This scale is a 15-statement validated questionnaire to indicate their level of agreement on a 5-point Likert scale ranging from strongly disagree to strongly agree. Higher scores represent more positive attitudes towards interprofessional learning. This survey was distributed electronically to 15 and 7, pharmacy and nursing faculty respectively. Data was exported to Microsoft Excel and analyzed by using same software. **Results:** A response rate of 92% (N=22) was achieved. Responding faculty members demonstrated a high positive attitude towards teamwork, communication, and value/ethics by 77%, 68%, and 68% respectively. Interestingly, 86% of Nursing faculty responded strongly agree on thirteen RIPLS statements. Pharmacy faculty, on the other hand, displayed a wide distribution of response scale ranging from disagree to strongly agree. Both faculties supported by strongly agreeing to statement regarding teamwork as essential skills (86% SON, 73% SOP). **Conclusions:** The findings from this survey support the need for future faculty development initiatives towards increasing understanding of interprofessional collaboration and to develop activities to teamwork in an academic setting.

**Awareness, Knowledge and Comfort of Pharmacy Students on Pre-Exposure Prophylaxis for HIV Prevention**
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**Objective:** Pre-Exposure Prophylaxis (PrEP) is a daily antiretroviral therapy to prevent acquisition of HIV in individuals at significant risk for infection. Pharmacists are uniquely qualified to promote PrEP; however, data suggest that pharmacists have poor familiarity with PrEP. No such data exist for pharmacy students. The objective of this study was to measure pharmacy students’ awareness, knowledge, and comfort regarding PrEP. The hypothesis of this study was that pharmacy students have limited awareness, knowledge, and comfort regarding PrEP. **Methods:** A 24-point questionnaire was developed to measure pharmacy student awareness, knowledge, beliefs, attitudes, self-efficacy, norms, and intent regarding PrEP use and promotion. The survey was distributed to pharmacy students at St. John’s University College of Pharmacy and Health Sciences between May 2, 2019 and May 31, 2019 via Google Drive. **Results:** There were 88 responses to the survey. Most students reported working in community pharmacies and about half of students reported taking elective courses in either HIV or infectious diseases. Almost 90% of students had heard of PrEP. Most students were able to correctly identify an FDA-approved regimen for PrEP; however, only slightly over half of students were able to identify the recommended duration of treatment. About 96% of students thought that a pharmacist or intern counseling patients on PrEP was beneficial; however, only slightly over half of students reported that they would counsel patients on PrEP and only about 17% of students reported that counseling patients on PrEP would be easy. **Conclusions:** Pharmacy students have strong awareness, but limited knowledge and comfort regarding PrEP. Results from the survey will be used to assess learning needs of pharmacy students regarding PrEP and inform future curricular changes.

**A Workshop to Improve Pharmacy Student Letters of Intent and Cover Letters**
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**Objective:** Letters of intent (LOI) and cover letters are increasingly important for candidates seeking a residency or job. Available literature in health science education about letter writing is sparse but primarily focused on residency training/preparation as part of larger career development workshops. To address a lack of focused time and active practice in the pharmacy school curriculum, a workshop was developed for fourth-year pharmacy students. **Methods:** A 2-hour
workshop at the annual school career fair was created for Fall 2019. The session included a brief overview of the letter structure, examples to practice identifying areas for improvement and providing feedback, and dedicated time to draft a letter. Peer-to-peer feedback was utilized for individualized support with time and faculty constraints. Introductory content and a rubric guided students in providing feedback. After the session, a 13-item survey with qualitative and quantitative questions was distributed. Results: Of the 57 participants, 30 (53%) completed the survey. Four students had previously started an LOI or cover letter and 28 were planning to apply for a residency. One hundred percent of students strongly agreed or agreed they were better prepared to develop their letter and 28/30 felt more confident in their ability. Qualitative analysis is currently in progress and will be presented at the meeting. Conclusions: A letter of intent and cover letter writing workshop for fourth year pharmacy students improved student confidence and self-assessed preparation.

Career Outcomes of a 10-Year Cohort of Graduates Who Participated in a Pharmacy Leadership Elective Course

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Objective: A Pharmacy Leadership Seminar (PLS) allowing P-3 students opportunities to discuss and learn about leadership and career development is offered annually. To date, no analysis has been performed to assess the career paths of PLS alumni or the benefit of this seminar on their career and leadership path. Methods: A survey was distributed to all 225 alumni of the PLS from its initial class in 2006 until the class of 2015. The 37-term online survey consisted of questions ranging from demographic information, leadership responsibilities in current professional roles, involvement in professional or community organizations, mentorship of pharmacy students, and subjective assessment of their leadership abilities. Finally, data were collected regarding participants’ subjective assessment of the value and impact of the PLS on their career and leadership abilities, as well as areas of improvement for the seminar in the future. Results: Out of 225 PLS alumni invited to partake in the study, 152 total survey responses were received. The final cohort of 133 surveys were analyzed (overall response rate of 59%). Participants reported highest satisfaction with their current ability to communicate and form relationships with colleagues, develop self-awareness, and obtain a satisfactory career. Developing self-awareness, communicating with colleagues, and forming relationships with colleagues were the leadership areas participants found the PLS impacted them the most. Conclusions: The results of our study demonstrated positive leadership outcomes in the alumni of the PLS. 93 participants (70%) ranked the PLS as having a superior impact on their overall leadership ability compared to the pharmacy curriculum. Based on survey results, in future iterations of the course, we plan to implement further opportunities for alumni engagement and mentorship programs.

Cases for Contraception: Assessment of Hormonal Contraceptive Prescribing Activity in Pharmacy Practice Laboratory

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Objective: To evaluate student knowledge of hormonal contraceptive provision, assess attitudes toward contraception prescribing activities, and gauge student perceptions of pharmacists’ expanding provider roles. Methods: Seventy-nine P2 students in the third integrated laboratory sequence completed an active learning activity utilizing case vignettes to introduce pharmacist-provided hormonal contraception practice using medical eligibility criteria, select insurance formularies, and patient factors. Students completed IRB-approved pre- and post-surveys regarding their knowledge of hormonal contraceptive use, current prescribing practices, and perceived value of pharmacists prescribing contraceptives. Additionally, students provided activity feedback and desired changes to enhance learning. Statistics were calculated for unpaired pre- and post-survey items using Mann-Whitney Tests with α = 0.05. Results: All responses indicated statistically significant increases in knowledge of pharmacist-provided hormonal contraception practices, as well as use of specific criteria and patient factors to select hormonal contraceptives with mean 5-point-scale change of 1.13 points (p<0.00025). Students strongly agreed or agreed their knowledge of pharmacist hormonal contraception provision (95.5%), understanding of pharmacist roles in providing hormonal contraceptive care (97.1%), and confidence in their ability to respond to contraceptive needs of patients in pharmacies (95.5%) had increased, and agreed the activity was beneficial to their overall educational experience (97%). Conclusions: Eleven states and the District of Columbia have passed legislation allowing pharmacists authority to provide hormonal contraception without a prescription. In these states, pharmacists prescribe and dispense patient-administered hormonal contraceptives, increasing patient education, contraceptive access, and improving overall health.
outcomes for women and children. There is hope that Louisiana and other states will soon adopt laws and conditions allowing pharmacists to prescribe and dispense contraceptives. This activity is used to prepare students for potential future expansion of their provider roles in pharmacy practice.

**Change in Pharmacy Student Interprofessional Attitudes Using a Case-Based Opioid Risk Mitigation Activity**

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**Objective:** To assess change in pharmacy students’ attitudes on interprofessional collaboration with dental and medical students in a case-based opioid risk mitigation activity within a required P3 course using the validated Interprofessional Attitudes Scale (IPAS). **Methods:** Pharmacy, medical, and dental students (from two different universities) were divided into small groups and presented with a case of a patient with opioid use disorder and acute pain. Students participated in a reflective discussion on their professional roles and responsibilities specific to the case and discussed how they can collaborate to contribute to better patient outcomes. Pharmacy students also taught medical and dental students how to administer naloxone. The IPAS was distributed before and after the event and was analyzed by grouping the IPAS survey into domains, using a Wilcoxon signed-rank test. Qualitative data from free-text responses from participating students were also analyzed. **Results:** A total of 296 pharmacy, 205 medical, and 74 dental students participated in this event. A total of 235 pharmacy students completed both surveys (79.4% response rate). Qualitative data from free-text responses from participating students were also analyzed.

**Characteristics and Predictors of Patient Care Performed by Clinical Department Chairpersons at US Schools of Pharmacy**

Douglas Slain, West Virginia University, Jeffery A. Goad, Chapman University, Lynette R. Moser, Wayne State University, Amy L. Seybert, University of Pittsburgh.

**Objective:** Clinical or practice departments at schools of pharmacy are usually composed of practicing pharmacy specialists. There is little known about the requirements for and frequency of patient care provided by clinical department chairs. The main objectives of this study were to determine the factors associated with and the frequency of patient care provided by clinical department chairs. **Methods:** A brief 16 to 22 question survey was sent to clinical department chairs at all 143 US schools of Pharmacy. Initial identification of chairs came from AACP with verification by school websites. Surveys from schools without a clinical chair (or similar position) were excluded, as were surveys from schools with Ph.D. Department chairs from blended departments (Clinical with Outcomes/Policy Sciences). **Results:** Of the 128 eligible schools’ department chairs, 113 completed the surveys (88.3% response rate). Forty-four (38.9%) chairs reported that they maintain an active clinical practice even though 80% report it is not required. Factors that had a significant association with clinical practice were: clinical service being an expectation (p=0.0004), having a practice prior to becoming chair (p=0.001), and having a lower administrative percentage (p=0.0003). Age, rank, and academic track were not significant predictors. Of those with clinical practice, they provided care in community (45.4%), acute care (38.6%), primary care (4.5%), and other settings (11.4%). A majority of these chairs reported providing direct patient care (81.8%), and 61.4% of chairs also provided care via supervision. **Conclusions:** Most schools of pharmacy do not require clinical department chairs to maintain a patient care practice, but 38.9% still choose to practice. Those that practiced before becoming a chair and have a lower administrative burden are more likely to continue to provide patient care.

Collaborating with a Municipal Health Department to Provide Influenza Vaccines to Public School Students

Objective: Current statistics indicate that approximately 50% of children and adolescents are vaccinated against influenza annually; this is much lower than the 70% targeted goal of Health People 2020. The objective of this project is to describe an interprofessional, innovative collaboration with a municipal health department, faculty and students of medicine, nursing, and pharmacy schools to provide influenza vaccines to public-school students in a mid-sized city. Methods: Faculty from an accelerated school of pharmacy collaborated with the city public health department, the public-school nursing director, school nurses, and medical students to facilitate flu clinics in six public schools. Pharmacy students on ambulatory care and community pharmacy Advanced Pharmacy Practice Experiences (APPE), first- and second-year medical students, and first-year nursing students participated in flu clinics at public schools from pre-school through high school. Duties for each clinic included staffing, transporting vaccines, screening consent forms and administration of vaccines. Qualitative data from APPE student feedback was collected. Results: Pharmacy students working in conjunction with medical students immunized over 400 children and adolescents against influenza. Pharmacy student feedback was overwhelmingly positive; feedback indicated they enjoyed working as a team with other healthcare students and professionals. Challenges included state age restrictions limiting vaccine administration for pharmacy students, inadequate staffing with medical/nursing students due to conflicts with academic obligations particularly when attempting to cover multiple flu clinics occurring on the same day. Conclusions: Students worked together in an effort to increase the percentage of children and adolescents vaccinated against influenza. Interprofessional activities incorporating public health issues are challenging but can have beneficial effects for not only the healthcare students but also for the health of the community.

Collateral Benefits of Co-Curricular Activities: Expanded Learning Outcomes, Stakeholder Reach, and Quality
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Objective: To illustrate the educational outcomes and key elements (Standards 1-4) met for a co-curricular program after its third year of implementation not limited to only the affective domains. To describe the variety of stakeholders involved, patient reach, and students’ willingness to recommend to a peer. Methods: Since the inception of our co-curricular program in fall 2016 with the incoming P1 class, our program has mapped ACPE Educational Outcomes Standards 1-4 and Key Elements for each co-curricular activity a student completes. This mapping is completed prior to the activity. As students complete their activities, they reflect on their learning for each educational outcome and this is reviewed in-person with their faculty advisor at least once each semester. Students complete five co-curriculars their P1 and P2 years and four their P3 year. Furthermore, students document which organization/community group the activity was sponsored, their hours to complete the activity, how many patients reached (if applicable), and if they would recommend the activity to a peer. Results: From fall 2016 to spring 2020, students completed 4,263 co-curricular activities. Non-affective domain key elements 1.1-2.4 were met for 27.3%, 11.5%, 9.1%, 16.3%, and 1.3% of the program’s co-curricular activities, respectively. Student pharmacists’ organizations made up the majority of stakeholders (41.5%). Students spend an average of 4.4 hours per co-curricular activity (SD = 16 hours). For activities with a patient-care component, students reached 15,179 through their co-curricular requirements. Peers reported not recommending 103 (2.4%) activities to peers. Conclusions: Mapping all domains and key elements has assisted the program in more closely identifying what areas a student may need to focus their learning, where duplication may exist, or where additional co-curricular activities may need developed.

Comparing Student Performance in Experiential Courses Using Entrustable Professional Activities (EPAs) vs. Conventional Competency-Based Instrument
Anastasia M. Rivkin, Fairleigh Dickinson University, Lillian Rozaklis, Fairleigh Dickinson University, Jaclyn Palummo, Fairleigh Dickinson University.
Objective: EPAs are units of work that graduates should be able to perform without direct supervision. Our School piloted an implementation of EPAs in experiential curriculum. Study objectives were to evaluate EPAs as an assessment strategy in advanced pharmacy practice experiences (APPEs), and to describe contexts for entrustment decisions. Methods: Three EPAs were piloted (Collect, Assess, Information Master). Data were collected via a survey administered using Qualtrics XM. Faculty rated students on EPAs at APPE midpoint and end using a 5-level rubric, and described context of entrustment decision-making. Students were entrusted if they were rated at level 3 or higher (able to perform activity with reactive supervision). Data were collected concurrently with the current method (PERFORM scale) for comparison. Descriptive and inferential statistical analyses were performed in MS Excel/IBM SPSS(v24).
Results: Sixty one students participated in the pilot; 122 individual student ratings were completed. EPA identified more underperforming students than PERFORM on final
evaluation. For Collect, of two students rated below level 3, one was rated competent on PERFORM (50%). For Assess, of 13 students rated below level 3, nine were rated competent on PERFORM (69%). For Information Master, of 14 students rated below level 3, six were rated competent on PERFORM (43%). There was a statistically significant difference between two instruments in their ability to identify students who could competently assess patients (p = 0.004, McNemar’s test). If APPEs required meeting all piloted EPAs at level 3, only 69% of students would have passed. Pilot also detected variability of clinical contexts used for entrustment decisions. Conclusions: EPA pilot identified misalignment between current and proposed evaluation approaches. Need for refinement of policies and additional training is evident prior to EPA implementation.

Comparison of Faculty and Non-Faculty Evaluations of Drug Information Papers During Advanced Pharmacy Practice Experiences
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Objective: To compare median grades of drug information (DI) papers between faculty and non-faculty preceptors. We hypothesized that median grades determined by faculty would be lower compared to non-faculty. Methods: Students progressing through advanced pharmacy practice experiences (APPE) are required to complete at least one DI paper. The assignment assesses written communication and critical thinking skills as students must identify and appraise medical literature to develop a multi-page response to a DI question. Since this assignment may be completed on any APPE, evaluations are completed by faculty and non-faculty preceptors. To limit potential bias from feedback on an initial DI paper, only the first DI paper grade of each APPE student from the Class of 2019 and 2020 were included in the study. DI paper grades were stratified according to faculty and non-faculty preceptors. Median grades were compared with the Mann-Whitney-U test. All data was analyzed in SPSS Version 25 software. Results: Fifty-seven DI papers were assessed by a faculty preceptor, and 272 DI papers were assessed by a non-faculty preceptor. Faculty preceptor evaluations resulted in a median grade of 90.7% (IQR 84.7%-95.2%) while the median grade by non-faculty preceptors was 96.3% (IQR 91.1%-100%). Grades assigned by faculty preceptors were significantly lower than grades assigned by non-faculty preceptors (p < 0.001). Conclusions: DI paper grades were significantly lower when evaluated by faculty preceptors. Further studies to assess interrater reliability of the DI paper rubric are needed to ensure grades provide a valid and reliable assessment of written communication and critical thinking skills.

Comparison of Student Advanced Pharmacy Practice Experience Readiness After Curriculum Implementation of Electronic Health Record
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Objective: To compare student pharmacists’ perception of the effect of integrating an electronic health record (EHR) simulation tool in the didactic curriculum on their preparedness for Advanced Pharmacy Practice Experiences (APPEs). Methods: Prior to 2019, students were exposed to patient cases only using paper format. During the 2018-2019 academic year, students received patient cases via an EHR format during a required PY3 course in the second semester. A survey was developed to assess students’ perception of their preparedness for accessing and interpreting patient data (using Likert scale, 0-10), and their attitudes towards implementing an EHR simulation tool in the didactic curriculum on their preparedness for APPEs. The survey was distributed prior to the start of APPEs to the Class of 2019 (paper and EHR) and 2020 (EHR). A Wilcoxon rank sum test was used to compare Likert scales by class. Results: A total of 232 and 255 students completed the surveys for the Class of 2019 and 2020, respectively (response rate: 2019 = 75%, 2020 = 86%). The Class of 2019 had a statistically significantly lower median score when asked about their preparedness to work-up patients, identify pertinent information, design evidence-based plans, and identify medication therapy problems prior to the start of APPEs, in comparison to the Class of 2020 (all p < 0.001). Both cohorts indicated that an EHR simulation tool should be implemented in the curriculum and will be beneficial for APPE readiness. Conclusions: Student pharmacists believed that implementing a simulated EHR within a required course will better prepare them for their APPEs. Future directions include surveying the Class of 2020 after completion of their APPEs to evaluate how utilization of the EHR helped to prepare them for APPEs.

Describing and Comparing Wellbeing Among First Through Third Year Student Pharmacists
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Nguyen, Mercer University, Eliana Lovett, Mark Stillman, C. Lea Winkles, Mercer University.

Objective: To characterize and compare the differences in wellbeing of first through third year student pharmacists. Methods: Investigators created an online survey instrument to assess student pharmacist wellbeing. Researchers conducted a literature review, leading to the integration of questions from the World Health Organization-5 Wellbeing Index (WHO-5, scored out of 25 points total, 0 being the worst and 25 being the best). Researchers also held focus groups with students to assess how student pharmacists interpreted wellbeing, which led to the incorporation of additional survey item domains: demographics, work/life balance, and spirituality. In Fall 2019, investigators distributed the survey to first through third year student pharmacists at one college of pharmacy. Descriptive and inferential statistics were performed using IBM SPSS (Version #25). A Kruskal-Wallis H test was used to determine if there were any differences in wellbeing between the three classes. Results: Approximately 64% (n= 248) of student pharmacists completed the survey. Respondents were 64.8% female (n = 164), 30.4% Caucasian (n=77) or 30.4% African American, and 53.1% of students (n = 134) ranged in age from 24 to 29 years. There was not a statistically significant difference in WHO-5 scores between the difference classes, χ²(2) = 3.396, p = 0.183, with a mean rank score of 9.56 (n=72) for P1 students, 10.31 (n=122) for P2 students and 10.26 (n=54) for P3 students. Conclusions: The WHO-5 scores for first through third year student pharmacists reveals an opportunity to enhance the wellbeing of student pharmacists through tailored interventions. Additionally, there was no difference in wellbeing between the three professional years.

Determination of Annual Curricular Competency Levels for Entrustable Professional Activities via a Faculty Survey
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Objective: As our school initiated the process of curriculum revision in Fall 2018, it was decided to incorporate the use of entrustable professional activities (EPAs) as core competencies within the curriculum. Part of this process included the determination of appropriate competency levels for each EPA annually within the new curriculum. Here we describe one method of doing so via faculty survey and analysis by the curriculum revision task force (CRTF) to determine these levels. Methods: All school of pharmacy faculty were emailed a Qualtrics® survey that asked them to identify the appropriate level of each EPA for all four years of the professional program, as well as entrance into the program. EPAs were determined on a 0-5 scale, from “general awareness only” to “no supervision needed.” Faculty were asked to set the EPA levels for graduation first, and then move backwards in the curriculum to allow for student growth. The mean results were reviewed by the CRTF to determine whether levels should be adjusted up or down for individual EPAs for each professional year. After agreement by the CRTF, they were brought before the faculty for their consensus and approval. Results: Forty of the 78 school faculty completed the survey. Survey means were varied across the EPAs but did increase in level from pre-professional to graduation appropriately. CRTF analysis endorsed these means and rounded them to the nearest whole number, with only minor exceptions. Subsequent faculty consensus supported these annual levels. Conclusions: The new curriculum was developed with annual levels of each EPA as the foundation of the curriculum structure. As new courses were developed, they were mapped to these new EPA competency levels.

Developing Cultural Competency of Pharmacy Students Through Immersive Theater
Lakesha M. Butler, Southern Illinois University Edwardsville.

Objective: To assess an immersive theater module focused on cultural competency for pharmacy students. Methods: During the 4th and 5th weeks of P2 required course, Health Promotion and Literacy, a new and innovative module was developed by pharmacy course coordinator and theater faculty. It consisted of a 2-hour interactive, immersive theater production held at an on-campus theater for half the class one scheduled class day and repeated again in 1 week for the other half of the class to facilitate an environment for true engagement. The pharmacy students were immersed into the production of scripted scenarios focused on cultural awareness, bias and stereotypes. Additionally, pharmacy students participated in an interactive talk-back with the characters who were still in character. All students in the course were requested to complete an anonymous, electronic survey assessing the module 1 week after module completion by all students. Results: 80% of the enrolled students (n=64)
completed the survey. The majority of the survey participants agreed or somewhat agreed that the immersive theater activity improved their understanding of the impact of social identities in the US and that pharmacy students should participate in similar theater experiences. 83% of respondents felt that the overall theater experience was either excellent or good. Sample qualitative survey data included comments of how enjoyable and interesting the module was in addition to being eye opening. Conclusions: Immersive theater is an innovative and engaging way to develop cultural competency in pharmacy students. Students are able to experience this topic through interactive participation. This module will continue to be offered in the required course and may also be offered for faculty development in the future.

Developing Practice Managers Through Simulation: Near-Peer Teaching in a Skills Laboratory
Colleen A. Dula, The Ohio State University, Annie Nebergall, The Ohio State University, Stacy A. King, Kristy Jackson, The Ohio State University, David E Matthews, The Ohio State University.

Objective: To develop and assess a series of community pharmacy near-peer teaching activities in a skills laboratory sequence and to enhance student knowledge, skills, and confidence through shared teaching and learning experiences. The activities are designed to address the Practice Manager Domain of the Entrustable Professional Activities as senior students manage, supervise, and P3s (83%) indicated they would like more near-peer teaching experiences. P3s reported improvement in their own understanding and skills (92% in spring, 73% in autumn), and 78% reported increased confidence in providing meaningful feedback. Conclusions: Near-peer teaching activities are valuable experiences that can enhance learning and confidence for both levels of learners.

Development and Assessment of an Interprofessional Escape Room for 800 First-Year Students from Nine Professions
Kelly Lempicki, Midwestern University/Downers Grove.

Objective: Escape rooms provide a unique environment for interprofessional team development, however there are logistical challenges when a large number of learners from many professions are involved. Our objective was to develop and assess an interprofessional escape room for 800 first-year students from nine professions. Methods: Students were assigned to an interprofessional team to complete a two-part escape room located in a classroom and a manikin simulation suite. Teams completed a series of six case-based puzzles that promoted teamwork and reinforced the roles and responsibilities of various health professionals. All puzzles were appropriate for first-year learners and required minimal set-up and clean-up. Afterwards, each team completed a reflection about their experience. Student perceptions about team strengths, challenges, and application of the experience to future practice were summarized from these reflections. Results: One hundred sixty-three teams completed the escape room. Strengths identified by the teams included their communication skills, collaboration, organization, perseverance, and respect for each other’s ideas. Team challenges included feeling rushed and disorganized. Teams also noted uncertainties about their team members’ skills sets, where to start when solving the puzzles, and how to interact with the manikin. Teams identified that the escape room promoted teamwork and interprofessional communication and reinforced roles and responsibilities. The importance of communicating with the patient and the need to be aware of their surroundings in future practice were also recognized. Conclusions: Students identified that the escape room reinforced several Interprofessional Education Collaborative core competencies and that the lessons learned were applicable to their future practice. Other institutions may explore utilizing interprofessional escape rooms for students early in their professional training to promote teamwork and reinforce roles and responsibilities.

Development and Assessment of P2 Pharmacy Student Activities Using the Interprofessional Education Collaborative Self-Assessment
Ricky B Thumar, MCPHS University–Boston, Rita Morelli, MCPHS University–Boston, Adrian Wong,
Objective: To evaluate the effect of interprofessional education (IPE) activities on P2 student pharmacist attainment of IPE core competencies using the Interprofessional Education Collaborative Competency Self-assessment Tool (IPEC).

Methods: Three large-scale IPE activities occurred as part of three required P2 pharmacy courses with internal physician assistant (PA) and dental hygiene (DH) students, as well as external dental students. Students discussed roles and responsibilities as well as a diabetes case and an HIV and oral health case over the course of the academic year. This was the first time P2 students were exposed to formal IPE activities within the curriculum. The IPEC was distributed at the beginning and end of the academic year. The change in IPEC domains (interaction, values) was analyzed using a Wilcoxon signed-rank test. Analysis of qualitative data from free-text comments was also performed.

Results: A total of 291 pharmacy, 100 PA, 40 DH, and 105 dental students from multiple universities participated; 115 pharmacy students completed both surveys (39.5% response rate). There was a statistically significant increase in median scores for both the interaction (begin: 4.4, IQR 4.0-4.8; end: 4.6, IQR 4.3-5.0; p<0.001) and values domains (begin: 4.9, IQR 4.5-5.0; end: 5.0, IQR 4.8-5.0; p=0.017). Qualitative data revealed successes (eg, self-awareness and application of didactic content, appreciation and understanding of other healthcare professions) and areas for improvement (eg, exam-sensitive scheduling, inclusion of additional disciplines).

Conclusions: Though evidently feasible, large student cohorts and the absence of a medical center affiliation present inherent logistical barriers to effective IPE delivery and assessment. Significant improvements in both IPEC domains suggest successful student understanding of related core competencies. Qualitative data support continued utilization of multiple IPE activities with P2 pharmacy students.

Development and Utilization of a Personal Leadership Development Plan for Pharmacy Students

Lakesha M. Butler, Southern Illinois University Edwardsville, Gireesh V. Gupchup, Southern Illinois University Edwardsville.

Objective: To evaluate the utilization and impact of pharmacy students developing a personal leadership development plan in an elective course. Methods: During an elective P3 course titled, Pharmacy Leadership and Advocacy, students learned about leadership styles and characteristics and completed a 6-step process to develop a personal leadership plan. The students discovered and developed: 1) who they are, including their strengths and weaknesses, 2) their passions, 3) current leadership
Development of an Integrative Medicine Elective for the Wellbeing of (Future) Practitioners and Their Patients

Lauren M. Hynicka, University of Maryland.

Objective: To describe the development of an Introduction to Integrative Medicine elective at the University of Maryland School of Pharmacy. Methods: A 2-credit, pass/fail course was developed and approved by the curriculum committee. The course is structured into workshops (5, 5-hour days), a group presentation and three assignments. The workshops took place over the two-week Winter Mini-Semester, intentionally planned as a “bootcamp” between academic semesters when pharmacy students need to practice self-care. Topics included eating healthy on a budget, yoga, exercise, aromatherapy, dietary supplements and Ayurveda. Many sessions included an experiential component so that students could try the integrative modalities. On the final day of class, student groups provided a 25-minute evidence-based presentation on a supplement or integrative medicine modality not described during the course. Prior to the start of the course, students completed a wellness inventory composed of the Perceived Stress Scale (PSS) and Subjective Happiness Scale (SHS), and answered a question about mechanisms they use for coping with stress. At the conclusion of the course, students identified one integrative medicine modality they planned to incorporate into their personal wellness plan and wrote a 1-2-page reflective piece on this aspect of the course. Students complete the wellness inventory again 3 months after the conclusion of the live portion of the course. Results: A total of 25 students enrolled in the inaugural course offering. By studying, experiencing, and reflecting on integrative medicine, students are able to more effectively support their own wellbeing and that of their patients. Conclusions: This practical, hands-on experience adds essential non-pharmacologic tools to the pharmacy student tool kit, which could be used in both patient care and pharmacy student wellness.

Development of a Self-Assessment Instrument to Evaluate Qualities and Behaviors Associated with Pharmacist Practice-Readiness

M. Jeanna Sewell, Auburn University, Erika L. Kleepinger, Auburn University, Kimberly B. Garza, Auburn University, Channing R. Ford, Auburn University, Amber M. Hutchison, Auburn University, Kevin N Astle, Auburn University.

Objective: To create, evaluate, and validate a self-assessment instrument assessing progression within the qualities and behaviors associated with pharmacist practice-readiness. Methods: Based upon the results from a qualitative analysis of surveyed standardized persons (SPs), the researchers developed a list of 14 qualities and corresponding behaviors identified as essential in practicing pharmacists: appearance, attentive, caring, confident, genuine, knowledgeable, organized, personable, person-centered, prepared, presentation, professional, respectful, and verbal communication. To examine whether SPs and pharmacy faculty agreed with how each quality/behavior was defined and how much they valued each quality/behavior, surveys were distributed via Qualtrics to SPs and faculty within the Auburn University Harrison School of Pharmacy organization. This survey utilized a mixed methods approach, including demographic information, a Likert scale for agreement with each quality and corresponding behavior, free responses for disagreement with descriptions, and ranking each item in their perceived order of importance. Chi square tested the difference in importance and t tests compared the mean rankings between the groups. Results: Survey response rates were 32.4% from faculty (n=23) and 91.8% from SPs (n=66). Faculty and SPs differed in their agreement with the importance of confident and genuine, with SPs endorsing greater importance of confidence and faculty endorsing greater importance of being genuine. There were no significant differences in ratings of importance by SPs and faculty on other qualities and behaviors. When ranking the qualities, knowledgeable was rated most essential across the entire sample, while presentation was rated least essential. Conclusions: Based on these results, the
instrument will be refined and externally validated. Once completed, the instrument will be utilized by student pharmacists for self-assessment of their progression on behaviors and qualities of practicing pharmacists.

Development of a Stress Scale for Pharmacy Faculty: Preliminary Findings and Next Steps
Anniesha White, University of North Texas Health Science Center, Adenike Atanda, University of North Texas Health Science Center, Sara Wettergreen, University of Colorado Anschutz Medical Campus, Karabi Nandy, University of Texas Southwestern Medical Center.

Objective: ACPE in Standards 2016 notes PharmD programs should ensure “assessments include measurements of perceived stress in faculty, staff, and students and an evaluation of stress’ potential for a negative impact on programmatic outcomes and morale.” Although validated stress instruments exist, there is none specifically for pharmacy faculty. The objective was to pilot test a stress scale for pharmacy faculty. Methods: A PubMed literature search was conducted utilizing key search terms: ‘faculty stress/burnout’ and ‘stress survey’. Forty articles were reviewed and 150 scale items from literature were categorized into constructs: 1) Support systems, 2) Mental health, 3) Physical health, and 4) Satisfaction. A draft survey was assessed by 20 experts confirming construct, question wording and content validity. A resulting, 10-question online survey was administered across five schools. Descriptive statistics were used to analyze data. Results: The 117 faculty who completed the survey comprised of 55% females, 73% pharmacy practice, and 36% assistant professor rank. Participating schools were 74% public. Nearly all participants had one or more hobbies, and 67% had children. The majority had not used counseling services (60%) and half had a mentor (51%). When asked on a scale of 1 to 5 to rate stress level (1=Low Stress, 5=High Stress), the mean was 3.54, SD 0.94. The item with the highest stress rating was “feeling that I have too heavy a workload” (mean 3.63, SD 1.22) and 34% felt fatigued and/or overwhelmed most days/daily. Stress was most often managed by enjoying a hobby or spending time with friends/family (23%). Conclusions: Preliminary findings are useful for stress reduction strategies and as indicators for targeted wellness initiatives. Next steps include survey administration to all pharmacy faculty via AACP listserv.

Diagnostic Process in Pharmacy Curriculum: Student Performance and Perception
Elif Ozdener-Poyraz, Fairleigh Dickinson University, Malgorzata Slugocki, Fairleigh Dickinson University, Julie Kalabalik-Hoganson, Fairleigh Dickinson University.

Objective: To evaluate professional year 3 (P3) students’ diagnosis skills and perception of diagnostic process training in one institution’s pharmacy curriculum Methods: One diagnostic patient case and five case-based questions were distributed to 72 P3 students to assess proficiency in the diagnostic process. A five-item Likert scale questionnaire was written to evaluate student perception of diagnostic process training in the pharmacy curriculum. All questions were administered using Examsoft. Descriptive statistics were used. Results: Most (70/72, 97%) students in the P3 cohort completed the activity. Nearly all students (98.6%) correctly identified the primary diagnosis. The majority (71.4%) correctly identified all key objective clinical findings relevant to the diagnosis. Only 40% of students correctly identified all key subjective clinical findings. The majority (62.9%) correctly prioritized the problem list. Nearly all (95.7%) believe this activity enhanced their diagnosis skills, and 54% strongly agree/agree the diagnostic process content should be increased in the pharmacy curriculum. Over half (57%) believe pharmacists play a significant role in the diagnostic process. Confidence in participating in the diagnostic process based on training received in pharmacy school was high (78.6% strongly agree/agree). Assessment questions were not validated. Conclusions: Most students correctly diagnosed the patient’s condition but fewer students believed pharmacists played a role in the diagnostic process. More effort needs to be placed on teaching students about the diagnostic process and the role of the pharmacist in this realm.

Diversity and Disparity in Healthcare: An Interprofessional Symposium for Clinical Educators
Lan Bui, Samford University, Melanie Manis, Samford University.

Objective: To describe an interprofessional symposium designed for clinical educators to increase awareness of diversity in disparity in healthcare. Methods: A half-day symposium, targeting educators and learners at a College of Health Sciences (CHS), consisted of 2 main activities: 1) presentation from a keynote speaker addressing the current state of racial and ethnic disparities in the United States healthcare system and 2) an interprofessional panel, consisting of a representative from nursing, pharmacy, medicine, physical therapy, and public health. The symposium aimed to provide an open dialogue for faculty, staff, and students to share their personal experiences of caring for and teaching a diverse population with differing customs and beliefs. At the end of the symposium, participants were asked to complete an evaluation of the program. Results: Thirty-six participants (92%) completed...
the evaluation tool and consisted of faculty, staff, and students from the following healthcare disciplines: pharmacy (n=18, 50%), nursing (n=8, 22%), physical therapy (n=3, 8%), public health (n=3, 8%), staff (n=2, 6%), medicine (n=1, 3%), communication science and disorder (n=1, 3%). On a scale from 1-5 (1=lowest; 5=highest), the median score (interquartile range) for the overall quality of the program was 5 (4.25-5). The majority of participants reported they gained one or more specific ideas that can be implemented in their area of teaching/practice (88%) and had better knowledge upon which to base decisions/actions in their teaching/practice (76%). Conclusions: The symposium provided valuable opportunities for interprofessional clinical educators and learners to discuss strategies and resources to overcome barriers associated with racial and ethnic diversities and disparities in healthcare. Ideas were generated on how to increase the diversity of programs offered amongst the CHS schools, including student orientation activities and simulation experiences.

Does P3 OSCE Performances Accurately Predict APPE Readiness?

Rick Hess, East Tennessee State University, Adam C. Welch, East Tennessee State University, John Bossaer, East Tennessee State University, Jim Thigpen, East Tennessee State University, Sam Harirforoosh, East Tennessee State University, Sam Karpen.

Objective: To determine whether P3 student performances on a four-station pilot OSCE correlates with their P4 advanced pharmacy practice evaluation (APPE) final grades. Methods: A four-station OSCE to measure APPE readiness was administered to all P3 students on April 17-18, 2019. All OSCE cases were created using a validated method of case writing, standard setting and piloting. Three OSCEs involved interactions with standardized patients (SP) and one involved a vancomycin dose calculation. Assessment of SP OSCEs was completed by the SP immediately after the interview while faculty assessed the calculation OSCE. All SP OSCEs were recorded and approximately 10% were retrospectively reviewed by faculty to validate results. The APPE evaluations were categorized into six groups: Institutional, Community, Ambulatory Care, Inpatient Internal Medicine, Direct Patient Care Elective, and General Elective. Student OSCE pass/fail results and the total number of completed analytical checklist items was compared to their APPE final grades received from May – December 2019. Two sample t-test was used to compare the mean APPE final grades between students passing and failing OSCEs. Pearson’s correlation was used to analyze the APPE final grades with number of analytical checklist items. Results: Sixty-seven students completed the OSCE and started rotations. OSCE pass rates ranged from 82 – 100% and APPE scores ranged from 79 – 100% across all groups. No significant differences were found comparing mean APPE grades. One moderate correlation (r = 0.42) was found comparing the number of checklist items completed in one OSCE station to Institutional APPE grades. No other relationships were observed. Conclusions: Performance in the four-station pilot OSCE did not correlate with APPE readiness. Limitations include sample size, small number of OSCE stations and high pass rates.

Double iRATs With Immediate Feedback Experience in a Team-Based Learning Infectious Diseases Pharmacotherapy Course

Alireza Fakhriravari, Loma Linda University, Lee H. Nguyen, Loma Linda University, Alireza Fakhriravari, Loma Linda University.

Objective: Traditional Team-Based Learning (TBL) includes a single, first in-class, individual Readiness Assurance Test (iRAT) in each instructional unit over the pre-class readiness materials. The aim of our study was to evaluate the effect of open-notes iRATs taken at home along with immediate feedback on students’ motivation to go through the pre-class materials, students’ perception of their performance on the close-notes iRAT taken in class, and students’ improved understanding of the rationale for the incorrect choices on the iRATs. Methods: We implemented a modified TBL andragogy consisting of two iRATs: an open-notes iRAT taken at home along with automated immediate feedback providing the rationale for the correct and incorrect answers upon submission and a closed-notes iRAT taken in class with questions nonidentical to the iRAT taken at home. All PY3 students (N=73) completed an anonymous survey at the end of the Infectious Diseases Pharmacotherapy course to evaluate this strategy. Results: 100% of the students participated in the survey. 67 (92%) students agreed/strongly agreed that the take-home iRATs motivated them to go through the pre-class materials. 67 (92%) students agreed/strongly agreed that the take-home iRATs helped them perform better on the in-class iRATs. 68 (93%) students agreed/strongly agreed that when they missed a question on the take-home iRAT, the rationale explaining why their choice was incorrect was helpful. Conclusions: A modified TBL consisting of an additional open-notes iRAT for each instructional unit taken at home and automated immediate feedback providing the rationale for the incorrect answers motivates students to go through the pre-class materials, helps them better understand the readiness materials prior to coming to class and perform better on the in-class iRATs.
Effectiveness of an Integrated Curriculum on Grades in a Nonsterile Compounding Course
Jessica N Newman, Yimo Wang, Robert P. Shrewsbury, University of North Carolina at Chapel Hill.

Objective: The contents of required pharmaceutics and nonsterile compounding courses were aligned and unified in a new integrated curriculum approach. Various assessments were compared between the stand-alone compounding (2018) and the integrated compounding (2019) courses to determine if the integration improved student grades. Methods: The assessments compared in the 2018 and 2019 compounding courses were the final exam grade, and weekly grades assigned by teaching assistants (TAs) of clinical discussions, pre-lab assignments, Compounding Records, and preparation labels. The same final exam was given in the 2018 and 2019 courses; all other grade sets were unique to each year. Statistical differences between the grade sets averages were calculated using the z-test ($p<.05$); the test was appropriate since the entire population variance was known and $n\geq 30$. Results: The comparison of the final exam grade in 2018 and 2019 was significantly different ($p<.0001$) with the 2018 class having the higher average grade. There were no statistical differences between the grade set averages of the clinical discussions, pre-lab assignments, Compounding Records, or preparation labels (ie, the TA graded assessments). Conclusions: It had been anticipated that the integrated curriculum would improve the student’s understanding of the interrelationships between pharmaceutics principles and compounding practice and these increased insights would be reflected in increased grade set averages in 2019. An explanation for the lack of improvement in 2019 could be that students had received adequate pharmaceutics instruction in the stand-alone compounding course during 2018 that was not augmented by the aligned courses in 2019. An additional explanation could be that this type of grade set analysis may not be an ideal format to evaluate pharmaceutics and compounding interrelationships.

Encourage and Scaffold Complex Mental Models of Pharmacists’ Roles in Public Health Through Concept Mapping
Dan Cernusca, North Dakota State University, Mark A. Strand, North Dakota State University.

Objective: With the increase of technology integration pharmacists are increasingly expected to move from dispensing tasks to complex problem solving and decision-making tasks related to provider status. The goal of this instructional intervention was to integrate concept mapping strategies in lectures and active learning tasks to scaffold students’ ability to build complex mental models associated with various roles of pharmacists in public health. Methods: In a Public Health for Pharmacists course the instructor integrated concept-mapping strategies from the lecture to active learning tasks. For a Hepatitis C case study, student-teams built concept maps that synthesized the role of pharmacists in improving population health with regard to Hepatitis C. Students’ concept maps were analyzed from a qualitative perspective with a rubric adapted from the literature to analyze the accuracy and correctness of the concepts, adequacy of concept links, the level of concept connectedness and the quality of map structure. Results: Students were able to generate complex and correctly represented conceptual models of the focal topic. Compared to the instructor’s map, student maps missed some critical concepts, had fewer multiple linked concepts, and some links were not accurately representing the relationships between the nodes they connected. Finally, the structure of students’ maps conveyed only partially the overall logic and abstractness of the relationships included in the instructor’s map, showing a fair understanding of the topic analyzed. These deficiencies provided focused instructional opportunities. Conclusions: Carefully implemented, concept mapping strategies can help students build and represent complex conceptual models relating complex roles of pharmacists in the public health realm. It also can provide instructors with a clearer picture of areas that need improvement to further help pharmacy students prepare for their professional journey.

Endocrine Education Within Clinical Sciences Curricula at United States Schools and Colleges of Pharmacy
Andrew Bzowyckyj, Pacific University Oregon, Jennifer Goldman, MCPHS University–Boston, Vasudha Gupta, Roseman University of Health Sciences, Justinne Guyton, St. Louis College of Pharmacy, Cynthia M. Phillips, University of South Carolina, Kayce M. Shealy, Presbyterian College, Jennifer M. Trujillo, University of Colorado Anschutz Medical Campus, Sarah M. Westberg, University of Minnesota, Chao Cai, University of South Carolina College of Pharmacy.

Objective: To determine the breadth and depth of endocrine instruction and assessment within pre-APPE coursework in the clinical sciences across United States (US) PharmD programs. Methods: A seventeen-question survey was distributed electronically via Qualtrics® to one targeted individual at each US PharmD program, determined via the program’s website as most likely to be teaching endocrine topics. Items included evaluation of specific endocrine content, contact hours, assessment strategies, and
Objective: Prepare students to use Bayesian estimation software to plan, analyze, and adjust vancomycin pharmacotherapy. Methods: A Microsoft Excel worksheet was created that mimics the functionality of most commercially available Bayesian software programs. The Excel worksheet can plan an initial dosing regimen, analyze vancomycin serum concentrations using Bayesian estimation, and modify the dosing regimen based on the analysis. Different population models can be selected based on patient characteristics. Using a flipped-classroom model, students in their final semester of the didactic curriculum were prepared to use the Excel worksheet in a one-hour recorded lecture. The lecture reviewed vancomycin pharmacokinetics and provided a tutorial for the Excel worksheet. A homework problem was assigned in which students used the worksheet to plan, analyze, and modify a vancomycin dosing regimen for a specific patient. In-class scenarios provided further practice with the dosing program. Results: The homework assignment was completed by 51 out of 57 students (89%). 15 out of 51 (29%) students did not design an appropriate initial regimen; however, in all but two cases the student used the worksheet correctly but failed to include a loading dose or failed to target the appropriate trough and area-under-the-curve (AUC). All but one student correctly adjusted the dosing regimen based on a measured vancomycin concentration. Nine students did not estimate an appropriate hold time. Conclusions: With minimal training, most third-year pharmacy students can achieve basic proficiency in using a Bayesian dosing program, built in Excel, to optimize pharmacotherapy. With this foundation, more complicated scenarios could be explored in class. Barriers to completing the homework warrants further investigation as 10% of students did not complete the assignment.

Enhancing Instruction of Vancomycin Pharmacokinetics with a Bayesian Dosing Simulator

Staci Hemmer, University of Montana.

Objective: Develop an Excel tutorial to prepare students to use Bayesian estimation software to plan and analyze vancomycin dosing regimens. Methods: An Excel tutorial was created that demonstrates the use of a Bayesian dosing simulator. An in-class activity was used to introduce the tutorial and provide practice with the dosing program. Results: The in-class activity was completed by 49 out of 57 students (86%). 12 out of 49 (24%) students did not design an appropriate dosing regimen; however, in all but two cases the student used the worksheet correctly but failed to include a loading dose or failed to target the appropriate trough and area-under-the-curve (AUC). All but one student correctly adjusted the dosing regimen based on a measured vancomycin concentration. Nine students did not estimate an appropriate hold time. Conclusions: With minimal training, most third-year pharmacy students can achieve basic proficiency in using a Bayesian dosing program, built in Excel, to optimize pharmacotherapy. With this foundation, more complicated scenarios could be explored in class. Barriers to completing the homework warrants further investigation as 10% of students did not complete the assignment.
Evaluating the Use of a Decision-Aid to Improve Students’ Knowledge of Type 2 Diabetes Medications

Michael S. Kelly, Chapman University, Luma Munjy, Chapman University, Richard Beuttler, Chapman University School of Pharmacy.

Objective: Medications for type 2 diabetes mellitus (T2DM) are recommended based on patient- and medication-specific factors (weight gain, cost, hypoglycemia, adverse effects, glucose-lowering efficacy, and comorbid conditions). A decision-aid for T2DM medications is available from the Mayo Clinic to aid clinicians and patients in shared-decision making. Whether decision-aids improve student knowledge is unknown. This study investigated whether a decision-aid improves students’ ability to choose T2DM medications based on patient-specific factors, and whether the decision-aid influences learning equally across high and low performing students.

Methods: Second year pharmacy students enrolled in the Endocrinology Therapeutics module were assessed on their ability to choose appropriate T2DM following implementation of a decision-aid. Pre- and post-intervention assessments were used to measure change in knowledge related to T2DM medications. Before the pre-intervention assessment, students viewed a recorded lecture comparing available T2DM medications to gain baseline knowledge. Following the pre-intervention assessment, the decision-aid was introduced and used with case-based assignments and for post-intervention assessment preparation, which occurred 1.5 weeks later. Students were categorized by cumulative GPA quartiles (39.86%) and highest in the top GPA quartile (65.91%). Post-intervention scores improved significantly (p<0.0001) and similarly across all GPA quartiles. Students in the upper quartiles scored higher than students in the lower quartiles (p<0.0001).

Conclusions: A decision-aid was associated with improved ability to select T2DM medications based on patient-specific factors. Scores improved similarly across GPA quartiles suggesting that decision-aids may be an effective tool to improve students’ ability to choose appropriate medications.

Evaluation of a Hospital-Wide Structured Interprofessional Education Program at a Non-Academic Community Hospital

Angela O. Shogbon Nwaesei, Mercer University, Bobby C. Jacob, Mercer University, Jonathan Perkins, Emory Decatur Hospital, Matthew Hogan, Emory Decatur Hospital.

Objective: To evaluate effect of a hospital-wide interprofessional education (IPE) program on students’ perceptions of physician-pharmacist clinical education targeting IPE competencies.

Methods: A 3-tier structured IPE program consisting of daily pre-rounds and teaching rounds, and once weekly lunch-and-learn sessions was designed between pharmacy and medical students at a non-academic community hospital. Student pharmacists completing a variety of Advanced Pharmacy Practice Experiences at the practice site participated in weekly lunch and learn sessions with all medical students on hospitalist team services at the site. Medicine APPE students also participated in daily pre-rounds and teaching rounds with medical students on the same team. Pre- and post-surveys were administered assessing students’ perceptions of physician-pharmacist collaboration in IPE using the Students Perceptions of Physician-Pharmacist Interprofessional Clinical Education-2 (SPICE-2) instrument, and perceptions were rated on a 5-point Likert scale (strongly disagree=1 to strongly agree=5). Students’ knowledge of evidence-based guidelines and perceptions of the educational intervention were also assessed. Data was analyzed using descriptive statistics and paired-student’s t-test for comparative data.

Results: Thirty-nine students (17 fourth-year student pharmacists, 22 third-year medical students) provided informed consent and were enrolled over 5 months. On the SPICE-2 survey, even though the majority of students had positive baseline perception scores, students showed significant improvement in their average perceptions scores on survey items related to IPE competencies on roles/responsibilities for collaborative practice and patient outcomes (P<0.05). Majority of students found the components of this program effective to very effective (70-100%). Students also showed improvement from the pre- to post-knowledge scores (P<0.05).

Conclusions: A structured approach to IPE had positive effects on students’ perceptions of physician-pharmacist clinical education targeting IPE competencies, and on their knowledge base.

Evaluation of an Escape Room Approach to Interprofessional Education and the Opioid Crisis

Sara Wettergreen, University of Colorado Anschutz Medical Campus, Ashley Huntsberry, University of Colorado Anschutz Medical Campus, Morgan Payne, University of Colorado Anschutz Medical Campus, Eric H. Gilliam, University of Colorado Anschutz Medical Campus, Susan Kresge, University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Benjamin Chavez, University of Colorado.

OLRs did. Faculty should consider incorporating OLR to better support students’ learning.

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Objective: The primary objective was to evaluate the use of an interprofessional, escape room activity to increase clinical knowledge related to the opioid crisis. The secondary objective was to evaluate change in attitudes toward interprofessional collaboration. Methods: Interprofessional teams of five students worked collaboratively to gain knowledge of the opioid crisis and roles of various professions by solving six puzzles. Concepts included epidemiology, alternatives to opioids, prescription drug monitoring programs, signs and symptoms of opioid overdose, and use of naloxone. While educational escape room methods are not new, this activity integrated clinical knowledge, resource identification, and interprofessional teamwork. Knowledge gained was assessed using a five question pre and post-test, while interprofessional attitudes were assessed using the Student Perceptions of Interprofessional Clinical Education-Revised (SPICE-R) instrument. McNemar’s Exact Test compared pre and post responses related to knowledge, while student’s t-test compared pre and post results for SPICE-R. Descriptive statistics were used for all other analyses. Results: Of the 88 total participants, 70 students completed both the pre and post survey and were included in the analysis. Distribution of represented health profession students was 54.3% pharmacy, 22.9% physician assistant, 10% dental, 10% nursing, 1.4% medicine, and 1.4% physical therapy. Student knowledge of the opioid crisis improved, with a statistically significant increase in the number of students correctly identifying signs of opioid overdose (40% vs 74.3%). Overall, there was a statistically significant increase in ratings of agreement on SPICE-R, which was driven by improvement in understanding professional roles and responsibilities. Conclusions: The use of an escape room educational method was effective in increasing some aspects of opioid crisis related knowledge and enhancing attitudes toward interprofessional collaboration.

Evaluation of a Qualitative Approach for Re-Design of a Pharmacists’ Patient Care Process Capstone Course

Beth Phillips, The University of Georgia, Russell Palmer, Daniel B. Chastain, The University of Georgia, Katie Smith, Andrea S. Newsome, The University of Georgia, Christopher M Bland, The University of Georgia.

Objective: To evaluate the use of a systematic qualitative approach that informed the re-design of a Pharmacists’ Patient Care Process capstone course from 2018 to 2019. Methods: Anonymous end-of-course evaluation comments from students in 2018 (n=125, 93%) and 2019 (n=129, 96%) were analyzed using an inductive qualitative approach to identify course strengths and areas for improvement. Themes identified in 2018 drove updates in course design for 2019. A cross-case comparison was conducted to analyze student perspectives between years. Results: The cross-case comparison identified the following similarities and differences. Identical themes occurred 6 times in both sets. Compared to 2018, the theme “improved patient work-up skills” was coded more frequently as a course strength (n=28 vs. 22), while the “lack of association between weekly cases and practical examinations” (n=33 vs. 85), “variation in weekly case format” (n=7 vs. 42), “lack of feedback” (n=13 vs. 19), “variation in grading” (n=5 vs 12), and “lack of sufficient practice cases” (n=5 vs 25) were coded less frequently as potential areas for course improvement. For course strength, 2 new themes were identified in 2019 vs. 2018. For areas of course improvement, 8 themes identified in 2018 were not present in 2019 data. More students rated the course “very impactful” with regard to confidence and readiness for Advanced Pharmacy Practice Experiences in 2019 (42% vs. 19%, p<0.05). Conclusions: A qualitative approach was useful in guiding re-design of a PPCP capstone course. After re-design the prevalence of themes related to course strengths increased, while the prevalence of themes related to areas for improvement decreased, and more students rated the course as very impactful.

Evaluation of Faculty Inter-Variability OSCE Grade Scoring on Overall Student Performance in a Laboratory Course

Salome B. Weaver, Howard University, Monika N. Daftary, Howard University, LaMarcus T. Wingate, Howard University, Malaik R Turner, Howard University.

Objective: To determine whether the inter-variability in faculty objective structured clinical exam (OSCE) grading has a significant impact on a student’s overall performance. Methods: A retrospective analysis was conducted using data from two cohorts of students that had enrolled in the Integrated Therapeutics laboratory course while in their third professional year from 2016 to 2018. Students were excluded from the study if they had withdrawn from the course or were dismissed from the pharmacy program during the study period. Descriptive statistics were conducted to describe a student’s baseline characteristics. Simple linear regression models and multivariate linear regression models were developed to determine which variables were predictive of the student’s overall student performance after adjusting for other factors. The study was approved by the Institutional Review Board (IRB) on January 2020. Results: There were 116 students that participated in the OSCE with a mean score of 66.7% ± 13.4. The IT Laboratory 2 grade (p = 0.014) and the mean GPA across all three corresponding IT lecture courses held during the semester (p=
Evaluation of Learning Outcomes of Pharmacy Students Enrolled in a Conventional Versus Vertically-Integrated Neuropsychiatric Curriculum

Stephanie L. Hsia, University of California, San Francisco, Julie T Nguyen, Amenda La, UCSF, Katherine Gruenberg, University of California, San Francisco, Conan MacDougall, University of California, San Francisco.

Objective: The objective of this study was to evaluate learning outcomes of pharmacy students in a conventional versus integrated neuropsychiatric curriculum.

Methods: Students in the integrated curriculum (2021T) were enrolled in one integrated course in Fall 2019 that covered physiology, pharmacology, and therapeutics of neuropsychiatric conditions and a skills course focused on communication and patient care skills. Students in the conventional curriculum (2021P) took separate physiology, pharmacology, and therapeutics courses over several quarters, culminating in the Therapeutics of Neuropsychiatric Conditions course in Fall 2019. Student self-rating of confidence/comfort with neuropsychiatric topics was collected via a Qualtrics survey prior to and after the courses. Performance in content and communication skills on an Objective Structured Clinical Exam (OSCE) and student self-ratings were compared between the cohorts using Mann-Whitney U tests and linear regression, respectively.

Results: Of the 95 students in the integrated cohort, 92 (97%) of the students completed both surveys. Of the 126 students in the conventional cohort, 97 (77%) of the students completed both surveys. 2021P had higher confidence/comfort at baseline compared to 2021T. Both cohorts improved significantly in their self-ratings for knowledge and comfort with neuropsychiatric content (p<0.05). There was no significant difference in the amount of improvement between cohorts. There was no significant difference in OSCE performance in content or communication between cohorts.

Conclusions: Differences in grading were found among graders. It is imperative that students are appropriately and fairly evaluated. Therefore, mechanisms will be instituted to ensure all evaluators are equipped to provide consistent grading when reviewing OSCES, including provision of adequate training.
Objective: To determine the ability of student-led study sessions to promote academic success among first-year (P1) pharmacy students. Methods: Nine study sessions were conducted by two second-year pharmacy students in fall 2019 at the University of Tennessee Health Science Center College of Pharmacy. Sessions included time management advice and guidance on strategies for preparing for composite exams. Participants included P1 students (Class of 2023), and attendance was voluntary. The Class of 2022 was used as a comparator group. Data collected from student records: demographics, having an undergraduate degree, P1 fall exam scores, exam outcomes specific to Pharmacy Math, and P1 fall GPA. Chi square and independent samples t-tests were performed. Relative risk ratio (RR) was calculated to determine the risk of failing Pharmacy Math based on study session attendance. Results: Of 200 P1 students, 24 attended five or more sessions and 176 attended less than five sessions, with mean attendance per student of 2.5 sessions (SD=1.5). While there were no significant differences between the Classes of 2022 and 2023 on any of the demographic and academic areas measured, a larger proportion of female students in the Class of 2023 attended five or more sessions compared to male students. Additionally, students who attended five or more sessions had a 6.8% reduction in risk of failing Pharmacy Math compared with students who attended less than five sessions.

Conclusions: Participation in study sessions led by P2 students reduced the risk of P1 students failing a challenging first semester course. These findings are important first steps to construct a first-semester peer-to-peer program for students to enhance their study habits and, therefore, their academic performance.

Exploring Career Development Through an Individualized Learning Experience: The Student Directed Practicum
David R. Steeb, University of North Carolina at Chapel Hill, Jackie M Zeeman, University of North Carolina at Chapel Hill, Antonio Bush, Association of American Medical Colleges, Sarah A. Dascanio, Adam M. Persky, University of North Carolina at Chapel Hill.

Objective: The objective of this study is to assess the impact of an optional student-directed career development program between the second and third year of a Doctor of Pharmacy curriculum where students participated in a career development summer experience (internship), developed SMART goals, and completed two reflective modules. Methods: Students participating in the student-directed practicum completed a 9-item pre-post survey assessing its impact on their career development within the learning constructs of discovery, application, and reflection. Additional open-ended questions assessed why students participated in the practicum and their perceived benefits of doing so. Students were followed until graduation where they answered additional questions about the impact of their practicum experience. Quantitative data were analyzed with paired t-test for the 9-item pre-post statements and descriptive statistics for the graduation survey while qualitative data used a two-cycle open coding process. Results: A total of 63 students from the Class of 2019 completed the student-directed practicum. All nine statements showed statistically significant growth with the largest growth within the learning construct of application. Students participated in the practicum primarily for exploring career options and enhancing their future employability. The graduation survey showed that those participating in the practicum had a higher rate of postgraduate placement (86% vs. 77%), receiving five or more residency interview offers (81% vs. 69%), and first or second choice residency match (92% vs. 85%) than those who only completed an internship. Students commented that the practicum was a valuable part of their education and helped them understand the next steps for their career. Conclusions: A student-directed career development experience can positively impact the career direction and professional development of students.

Exploring Pharmacy Students’ Interests in Digital Badges

Objective: To identify from students motivating factors, both intrinsic and extrinsic, for pursuing digital badges, perceptions of the value of pursuing digital badges and concerns and challenges for participating in digital badging. Methods: An online survey was emailed to P1, P2, and P3 students. Information including year in school, pharmacy GPA, organizational membership and level of activity in co-curricular activities was obtained. A five-point Likert scale indicating perceived value, motivating factors and challenges to pursuing a badge were assessed. Overall likelihood of pursuing a digital badge and top choices for types of badges were queried. Descriptive statistics and other appropriate statistical tests were performed to determine associations with various variables such as GPA, pharmacy leadership and co-curricular involvement. Results: A total of 124 usable responses were received representing an overall 52.3% response rate. A majority indicated that digital badges had perceived value for recognition, as motivator for participation, and for
learning. Both extrinsic and intrinsic motivators would influence decision to pursue a digital badge. There was a statistically significant association with extrinsic motivators and decision to pursue a digital badge. (P < .05)

Lack of course credit and valid assessment were the only two challenges that were statistically associated with influencing decision to pursue a digital badge. (P < .05)

Leadership and community engagement were the top two desired digital badges. Conclusions: The survey data provides insights that helps determine best practices for designing a digital badge as a form of micro credentialing for differentiating skills among students. Educating students on potential value of badges are necessary steps before allocating time and resources to implementing digital badges.

Factors Associated with NAPLEX Success in a Diverse Pharmacy Student Population
Karen R. Sando, Nova Southeastern University; David Sicre, Nova Southeastern University.
Objective: To examine the relationship between student demographics, pre-admission characteristics, Pharm.D. program performance, PCOA scores and NAPLEX performance among graduates at a Hispanic-serving multi-campus pharmacy school between 2016 and 2018.
Methods: A retrospective review of pharmacy graduates’ demographics, pre-pharmacy academic factors, pharmacy academic performance, PCOA scores, and NAPLEX scores were performed. Bivariate (eg, ANOVA or independent samples t-test) and correlational analyses were conducted as well as stepwise linear regression to examine the association between factors and the NAPLEX total scaled score. Results: Five hundred seventy-two graduates were included in the analysis, with the majority being Hispanic (52%) and female (70%). Mean NAPLEX score was 93.4 ± 18.2. The association between Native English-speaking graduates and NAPLEX passing rates was not found to be statistically significant (P=.673). There was a statistically significant difference between NAPLEX score and on-time graduation status (p<.001), with students not graduating on time achieving a lower mean NAPLEX score (94.4 vs. 76.87). PCOA overall scaled score (r=0.53), Pre-APPE GPA (r=.65), and final Pharm.D. GPA (r=.64) were moderately correlated with NAPLEX total scores (p<.001 for each). Stepwise regression analysis included final Pharm.D. GPA and PCOA overall scaled score in the final model, accounting for approximately 48% (R2=.475) of the variance in NAPLEX total scaled score. Conclusions: PCOA overall scaled score and Final Pharm.D. GPA are significant predictors of future success on NAPLEX performance in a predominately Hispanic student population.

Factors Influencing Pharmacy Faculty Behavior, Perceptions, and Challenges with Determining Authorship Credit
Objective: To identify among pharmacy faculty: challenges in determining authorship and author order; factors and criteria that influence behavior in determining authorship and author order; beliefs about authorship and familiarity with ICMJE guidelines; and perceptions of substantial contributions. Methods: An online survey was emailed to faculty from three groups of schools categorized by degree of external research funding. Demographic questions and questions addressing research objectives were created. Three case studies involving multidisciplinary co-authorship, a student project, and a resident project were also included. Results: A total of 295 usable responses were received representing an overall 30.2% response rate. Majority (63%) of faculty experience power pressures when determining authorship. Justifying authorship alone for supervision of student projects and statistical analysis was common. Quantity and quality of contributions were the most common reason for justifying order. Writing substantial sections of a paper was ranked the most important component in determining authorship order. Differences in justifying authorship based on P&T pressures were noted by academic rank, tenure status and academic discipline. Familiarity with ICMJE guidelines did not appear to influence behaviors. Conclusions: Pharmacy faculty have obligations to publish, most often collaboratively. There is a plurality of perceptions and attitudes among faculty in relation to authorship. A model for recognition of contributions is needed. More structured guidance in concert with moral and ethical principles would help to clarify how to best establish authorship and order.

Five Year Analysis of Scholarship of Teaching and Learning Publications by Pharmacy Practice Faculty Members
Kalen B. Manasco, University of Florida, Lindsey Childs-Kean, University of Florida.
Objective: The objective of this study was to characterize the successful publication of pharmacy practice faculty members over the past five years in the area of scholarship of teaching and learning and compare that publication rate to overall publication rates of pharmacy practice faculty members in Colleges of Pharmacy in the United States.
Methods: A 25-question Qualtrics survey was created to determine the number and type of peer-reviewed
Geriatric Elective Course Impact on Pharmacy Student Knowledge, Attitudes and Empathy Regarding Older Adults

Leisa L. Marshall, Mercer University, Jenn L. Nguyen, Mercer University, Lydia C. Newsom, Mercer University, Kathryn M. Momary, Mercer University.

Objective: To evaluate students’ knowledge, attitudes and empathy regarding older adults at the beginning of a Geriatric Pharmacy elective and to determine the impact of the elective on students’ knowledge, attitudes and empathy regarding older adults.

Methods: A 15-week Geriatric elective course for third-year students focuses on care of older adults using the Pharmacist Patient Care Process. Psychosocial aspects, physiologic changes, and medication management issues in older adults are major course themes. Enrolled students Fall 2019 were invited to participate in the study via IRB-approved Informed Consent. Students completed IRB-approved pre- and post-surveys. The survey consisted of three validated instruments, the Revised Palmore Facts on Aging Quiz (FAQ), the University of California at Los Angeles Geriatric Attitudes Scale (UCLA-GAS) and the Kiersma-Chen Empathy Scale, as well as demographic questions. Composite scores for the three instruments were calculated as per the literature. The pre- and post-survey item statistics were compared using the Wilcoxon Signed-Rank Test with α = 0.05. Results: Twenty-eight of 32 (87.5%) enrolled students, 20 ♀ 8 ♂, completed all items on both pre- and post-surveys. Six students indicated previously taking a course on aging. Responses on the Revised Palmore FAQ indicated a statistically significant increase, p < 0.001, median pre/post-survey scores, 33 and 36, respectively. Responses on the UCLA-GAS also indicated a statistically significant increase, p < 0.01, median pre/post-survey scores, 54 and 57.5, respectively. The Kiersma-Chen Empathy responses did not indicate a statistically significant increase, p = 0.053.

Conclusions: Knowledge and attitudes regarding older adults increased significantly, implying that the course positively affected student knowledge and attitudes. Prior experience with older adult family members/patients, career choice and pre-selection bias of enrolled students may have influenced the pre- and post-survey results.

Giving Students a Voice: A Pilot in Soliciting Constructive Student Feedback Using the KSS Model

Apryl N Anderson, Virginia Commonwealth University, Alexis N Crawford, Virginia Commonwealth University, Krista L. Donohoe, Virginia Commonwealth University, Laura M. Frankart, Virginia Commonwealth University, Abigale T. Matulewicz, Virginia Commonwealth University, Lauren M. Caldas, Virginia Commonwealth University.

Objective: Keep-Stop-Start (KSS) is a model for providing brief, constructive feedback that can be applied to a variety of settings. It consists of three questions: what should the instructor “keep,” “stop,” and “start” doing. This pilot study aims to (1) describe the KSS model for weekly student feedback in skills laboratory courses and (2) assess the impact of KSS on course evaluations.

Methods: Instructors of pharmacy skills laboratory courses (n = 5) across three didactic years solicited weekly student feedback through the KSS during Fall 2019. A QR code linked to a Qualtrics survey was posted in all laboratory classrooms and electronically on certain PowerPoint slides. Student feedback was voluntary and inspired changes that were integrated before completion of final course evaluations. Course evaluations, provided as mean scores on a Likert scale of zero to four, were compared from before and after KSS implementation using unpaired t-tests. Results: The number of KSS responses varied by pharmacy student year: n = 50 (first-year), n = 15 (second-year), n = 7 (third-year). Overall course evaluation scores significantly improved for second and third-year students but did not statistically increase for first-year students after implementation of the KSS feedback model.
A significant increase was noted in mean scores (3.1 vs. 5.33, p<0.01), percent of students who answered all questions correctly on the knowledge assessment (44.3% vs. 76.2%, p<0.01) and in students' self-reported ability to define IPE, explain RR of other professionals, explain similarities and differences in RR among various professionals, and explain the need for IPE collaboration. Overall, students felt this IPE event was a valuable learning experience. Conclusions: A single game-based learning approach to IPE can be effective in increasing student’s understanding of roles and responsibilities of various health professionals.

Impact of a Satellite Pharmacy Simulation for an Applied Skills Course in a Multi-Campus Program
Kendall D. Guthrie, University of Missouri-Kansas City, Kylie N. Barnes, University of Missouri-Kansas City, Maquall R. Graham, University of Missouri-Kansas City, Dominick J. Salvatore, University of Missouri-Kansas City.
Objective: To determine if a low-stakes, structured simulation focused on communication between pharmacy students and a healthcare provider impacts student performance on an Objective Structured Clinical Examination (OSCE).
Impact of a Simulated Interpreter Experience on Students’ Self-Assessed Confidence and Competency in Communication

Kristy Jackson, The Ohio State University, David E Matthews, The Ohio State University, Anna C. Haas-Gehres, The Ohio State University.

Objective: To measure the impact of a live, simulated encounter involving a standardized patient and interpreter on student self-assessed confidence and competency in communication. Methods: Third-year (P3) students completed a standardized encounter with a patient and interpreter using bilingual volunteer facilitators recruited from the university and community. Before the activity, students completed a pre-survey assessing their confidence in using an interpreter. Students with experience using interpreters also self-assessed their competency in employing communication best practices with interpreters. After the activity, all students repeated the self-assessment of confidence and competency. Additionally, activity facilitators evaluated students using the same criteria. Students’ perception of value of the activity was measured upon completion. This study was determined to be exempt from review by The Ohio State University IRB.

Results: A total of 117 out of 119 students responded to the pre-activity survey and 116 responded to the post-activity survey. Student confidence scores as measured on a 4-point Likert-type scale increased after the activity (2.19 pre-activity vs. 2.61 post-activity). Among students with prior experience using interpreters, self-assessment of competency as measured on a 4-point Likert-type scale and averaged across all criteria increased (3.21 pre-activity vs. 3.50 post-activity). Among all students who completed the activity, the average self-assessed competency score was 3.53, and the average facilitator assessment of competency was 3.83. Immediately following the activity, 82% of students stated the activity was “very valuable,” and 18% stated it was “somewhat valuable.” Conclusions: The use of a simulated interpreter in a patient encounter activity increased students’ confidence and self-assessed competency. Activity facilitators consistently rated student competency higher than students’ self-assessments, implying that students may have improved their skills to a greater extent than they perceived.
were expressed as frequencies and percentages, and continuous variables were expressed as means and standard deviations. Chi-square was used to evaluate student performance. An a priori alpha level of < 0.05 was considered statistically significant. Results: The majority of students (72%, n=54) preferred the TBL + IVD compared to a TBL-only format. More students reported higher engagement with TBL + IVD (84%, n=63). Correct responses on exams for CAP-related content was higher in the TBL + IVD group (67% vs. 55%, p < .001). Specific positive themes derived included an increased opportunity to defend recommendations verbally, and increased interaction with an on-campus faculty member. Conclusions: The study results demonstrate the addition of a TBL + IVD can enhance student perceptions, confidence, and performance within a large multi-campus pharmacotherapeutics course.

Impact on Accessibility of Digital Content After Integrating an Accessibility Tool in Online PharmD Courses
Erica Rhein, University of Colorado Anschutz Medical Campus, Shaun E. Gleason, University of Colorado Anschutz Medical Campus, Kate Miller, University of Colorado Denver, Michael Lampe, Paul M Reynolds, University of Colorado Anschutz Medical Campus.

Objective: Ensuring accessible digital content in online courses allows students to successfully engage with course content. Meeting accessibility standards may benefit all students by improving usability and providing alternative avenues to consume educational materials. This project aimed to evaluate improvements in accessibility after integrating an accessibility tool, Ally®, in an online PharmD program. Methods: In Fall 2019, Ally® was integrated into the Canvas® learning management system (LMS) for the University of Colorado Skaggs School of Pharmacy’s online courses. Baseline accessibility data were collected retrospectively for Fall 2018 courses. However, no accessibility scores or recommendations were visible to LMS users during this semester. Beginning in Fall 2019, accessibility modifications occurred at the discretion of instructor or by teaching assistants as time permitted. Accessibility scores generated included a file score, a what-you-see-is-what-you-get (WYSIWYG) HTML score, and an overall score. The overall score is a weighted composite of the file and WYSIWYG scores. A t-test was utilized to compare course scores before and after Ally® implementation. Results: Ally® scores from 9 courses held in both Fall 2018 and 2019 semesters were collected and compared. 3652 files and 1689 WYSIWYG pages were analyzed. Compared with 2018, implementation of Ally® in Fall 2019 courses significantly improved mean accessibility scores for course files (59% vs 65%, P<0.05) and overall scores (40% vs 45%, P<0.05). No significant differences were observed in WYSIWYG scores. Conclusions: Implementation and integration of Ally® was associated with a statistically significant improvement in overall and file accessibility scores for Fall 2019 DDP courses. WYSIWYG scores were not significantly different but notably were very high at baseline. Further analysis regarding impacts on student learning and perceptions is warranted.

Implementation and Assessment of a Roles and Responsibilities Activity Utilizing the Interprofessional Attitudes Scale (IPAS)
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Objective: Implement an interprofessional roles and responsibilities activity with healthcare students and student prescribers from a partnering university and assess change in P2 pharmacy students’ attitudes in working collaboratively with physician assistant (PA), dental hygiene (DH), and dental students (DS). Methods: Pharmacy, PA, DH, and DS from a collaborating university participated in an introductory IPE activity that included completion of a professional entry-level roles and responsibilities inventory checklist with groups working as a team. This was the pharmacy students’ first formal IPE activity. The IPAS was administered to pharmacy students before and after this activity. The IPAS survey was grouped into domains and a Wilcoxon signed-rank test, along with qualitative data from free-text responses from participating students, were used for data analysis. Results: A total of 291 pharmacy, 100 PA, 40 DH, and 25 DS from two different universities participated in this event. A total of 210 pharmacy students completed both IPAS surveys (72.2% response rate). Pharmacy students rated themselves highly in all domains before and after the activity. There was no statistically significant change in any of the five IPAS domains. Qualitative data suggest pharmacy students appreciated the activity and the opportunity to collaborate with PA, DH, and DS. Conclusions: Despite positive commentary, there were no significant changes in attitudes. Prior exposure in the P1 year with an IPE orientation lecture and some exposure in
IPPEs may have influenced the high baseline IPAS scores. Future directions would be to introduce this activity in the P1 year prior to any IPE exposure, to collect data from other disciplines, and to explore other validated tools to better assess significant outcomes.

Implementation of a Pilot Video Reflection Program to Improve Oral Communication Skills
Connie Y Chen, Jaekyu Shin, University of California, San Francisco, Crystal Zhou, University of California, San Francisco, James M. Lightwood, University of California, San Francisco.
Objective: The purpose of this study was to implement a pilot video reflection program and to assess the program by comparing communication scores in Objective Structured Clinical Examinations (OSCEs) and students’ self-confidence level in communication between those assigned to video reflections and to written reflections. Methods: We assigned the class of 2021T to either a video (n=48) or a written reflection assignment group (n=48) in the 2018-2019 academic year. For weekly reflection assignments, the video reflection group recorded their self-reflection using electronic devices while the written reflection group wrote their self-reflection. During the 2018-2019 academic year we administered 2-6 OSCE stations 3 times to assess oral communication skills and identical surveys using Qualtrics Survey 3 times to measure students’ self-confidence level in communication skills over time. We combined oral communication scores in different stations on each OSCE. Then we compared the combined OSCE scores on self-confidence level in oral communications skills between the two groups by using the Wilcoxon rank sum test. Results: The video self-reflection was successfully implemented: all students completed weekly self-reflections according to their group assignments. The median combined OSCE oral percent communication scores ranged from 75-81% and was not significantly different between the groups at each time point. In addition, the median self-confidence level was 7 (interquartile range 6-8) and not significantly different between the groups at each time point. Conclusions: Although the video self-reflection was successfully implemented, it did not significantly increase OSCE scores and students’ self-confidence level in oral communications skills compared with the written reflection group. Given the favorable reception by students, we will continue to explore the video reflection in the 2019-2020 academic year.

Improving Confidence in Applying the Pharmacists’ Patient Care Process Through an Interprofessional Activity
Jaime L. Maerten-Rivera, University at Buffalo, The State University of New York, Yichen M Zhao, University at Buffalo, Nicholas M Fusco, University at Buffalo, The State University of New York.
Objective: To compare the change in pharmacy and physician assistant (PA) students’ confidence in their ability to complete steps of the Pharmacists’ Patient Care Process (PPCP) and their attitudes toward interprofessional collaboration before and after participation in an interprofessional activity. Methods: Second year pharmacy students and second year PA students completed an interprofessional activity in teams of six (four pharmacy students and two PA students per team) in which they

applied the PPCP to a patient case to create an interprofessional plan of care. Students completed a pre and a post survey regarding their confidence in completing steps of the PPCP and their attitudes toward interprofessional collaboration. At post students also completed a program evaluation. Results: There were 117 pharmacy and 58 PA students divided into 29 interprofessional teams. Of those, 99 (85%) pharmacy and 52 (90%) PA students completed both the pre and post surveys. There was a statistically significant increase in confidence to apply the PPCP for all students. The effect size for all items were considered large. There were no changes in attitudes toward interprofessional collaborative practice. Overall, the activity was rated highly by students as reflected in the program evaluation. Conclusions: The interprofessional activity demonstrated a positive effect on students’ self-reported confidence in their ability to complete steps of the PPCP. While the interprofessional activity did not affect student attitudes toward interprofessional collaborative practice, the activity was rated highly and most found it to be an important part of their professional development.

Incorporating Real Patients into Laboratory Activities to Simulate Principles of the Pharmacists’ Patient Care Process

Maureen E. Knell, University of Missouri-Kansas City, Dominick J. Salvatore, University of Missouri-Kansas City.

Objective: ACPE Standards 2016 include preparing students to provide patient-centered care following the Pharmacists’ Patient Care Process (PPCP). The objective was to develop laboratory activities to engage students in applying the collect, assess, and plan principles of the PPCP and evaluate students’ perceptions. Methods: Real patients with arthritic conditions were incorporated into a daylong interactive small group activity intended to allow students to engage in PPCP during a two-part Applied Skills/Pharmacotherapy Lab. Small groups of students across three campuses worked with an assigned arthritis patient. The first lab focused on the collection principle of PPCP, interviewing the patient to collect and confirm current medications, medication use history, and pertinent health data. In the second lab, students met with the same patient to perform the assess and plan principles of the PPCP by completing a Patient Health and Medication-Related Action Plan and an Arthritis Treatment Plan with their patient. Results: Data was collected for two years (2018-2019, N = 221) using a five-point Likert scale. Students strongly agreed or agreed (98.6%) they were more confident in their interviewing skills after completing the patient care activities related to the collection step of the PPCP. The majority of students also strongly agreed or agreed (91.9%) that they were more confident in collecting patient information after the experience. Students strongly agreed or agreed that they were able to assess and apply their knowledge to complete a Patient Health and Medical-Related Action Plan (94.6%) and a Treatment Plan (91.9%) during the experience. Conclusions: Providing students an opportunity to engage with real patients in a simulated patient-care environment increased the students’ self-perceived abilities in collecting, assessing, and planning components of the PPCP.

Incorporating Standardized Patients into a Modular Organ Systems Therapeutics Course in a PharmD Program

Brooke D. Fidler, Long Island University, Tamara Goldberg, Long Island University, Roda Plakogiannis, Long Island University, Dovenia S. Ponnoth, Long Island University, Elaena J. Quattrocchi, Long Island University.
Objective: To compare students’ scores pertaining to diabetes exam questions in students participating in a standardized patient (SP) driven workshop in 2019 to students exposed to a virtual patient simulation (VPS) workshop in 2018. Students’ perceptions of the SP encounters were also assessed. Methods: Approximately 204 students participated in a workshop related to hyperlipidemia, hypertension and diabetes. Randomized groups of students were asked to interact with standardized patients (SP), who were PGY1 pharmacy residents. Students worked together to obtain a medical history from the SP, develop a plan and create a SOAP note. Student performance on diabetes exam questions from 2019 were compared to performance on the same exam questions from 2018. Students in 2018 were exposed to an interactive VPS case during the same workshop. An eleven-item survey (four-point Likert type scale) was administered after the completion of the workshop to assess students’ perceptions of the activity. This project received IRB exempt approval. Results: Findings revealed no difference in students’ performance on the exam questions between the 2019 class exposed to SPs compared to the 2018 class exposed to VPS. However, the student perception survey demonstrated positive attitudes towards the SP interaction. Between 87%-94% of the 2019 group agreed or strongly agreed, respectively, that interacting with SPs had a positive impact on their confidence, ability to display empathy, and ability to make recommendations. Conclusions: Student exam performance did not differ between the SP driven and virtual patient simulation workshop. However, positive student perceptions were reported, supporting the usefulness of utilizing SPs in a required therapeutics course.

Incorporation of Daily Mindfulness Activities into a Didactic Pharmacotherapy Course

Ryan E. Owens, Wingate University, Jackie Brogie, Antoine J. Al-Achi, Campbell University, Shawn R. Taylor, Wingate University.

Objective: To assess the impact of daily mindfulness-based activities on the level of dispositional mindfulness in students enrolled in a didactic pharmacotherapy course. Methods: Third year pharmacy students completed the Mindful Attention Awareness Scale (MAAS) prior to the start of a five-week complementary and alternative medicine didactic pharmacotherapy course. The MAAS consists of 15 questions rated on a numerical scale, with higher scores reflecting a higher level of dispositional mindfulness. Students participated in approximately 5 minute mindfulness-based activities four days per week at the beginning of each class. The specific mindfulness interventions varied and consisted of meditations, breathing exercises, tai chi, body scans, drawing, and music. Students repeated the MAAS at the conclusion of the five week course with three additional questions to assess the students’ perception of utilizing mindfulness activities. Data was analyzed using an unpaired student’s t-test. Results: Overall, 76 students completed the pre-MAAS and 71 students completed the post-MAAS. The mean score on the pre-MAAS was 3.27 and the mean score on the post-MAAS was 3.31, indicating a non-significant change in dispositional mindfulness (p=0.77). However, 45% of students noted that incorporating mindfulness activities at the start of class helped to reduce stress and anxiety levels and 56% indicated they will take the mindfulness concepts forward and apply them to their personal and professional life. Conclusions: While there were no significant changes in dispositional mindfulness after the five-week intervention, student perceptions of the use of mindfulness activities in a didactic course were positive. Longer interventions and mindfulness-based activities in sequential didactic courses should be explored to determine if longitudinal incorporation yields a significant benefit.

Influence of Open-Notes Pre-Class iRATs on Grade Inflation in a Team-Based Learning Pharmacotherapy Course

Lee H. Nguyen, Loma Linda University, Alireza FakhriRavari, Loma Linda University, Alireza FakhriRavari, Loma Linda University.

Objective: Traditional Team-Based Learning (TBL) utilizes a single individual Readiness Assurance Test (iRAT) in each instructional unit over the pre-class readiness materials. The aim of our study was to determine whether employing a second iRAT taken at home with open-notes in addition to the in-class iRAT would lead to grade inflation in the course. Methods: We implemented a modified TBL methodology in the infectious diseases (ID) course with the addition of a supplemental at home open-notes iRATs where students are required to complete the iRAT prior to coming to class. iRATs taken at home had no time limit and were used to guide the students through the course topics. iRATs taken at home were closed-notes with questions nonidentical to the iRATs taken at home. The grade weight of the iRATs at home and in class were identical. Ten percent of the course grade was based on iRATs. Results: Seventy-three students completed the course. Final grades in ID (percent, mean ± SD) were 90.22 ± 4.04 with home iRATs were not significantly different when compared to the grades with the home iRAT scores removed, 89.2 ± 4.36, p=0.145. The grades of students at the 50th percentile and lower were 87.3 ± 3.6, which was not significantly different with home iRAT scores removed, 86.05 ± 3.88.
Information Cues and Barriers in the Management of Drug-Drug Interactions
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Objective: To examine informational cues upon which healthcare professionals (HCPs) rely to manage drug-drug interactions (DDI) for patients, and to identify barriers they encounter during their decision-making process.

Methods: At a tertiary care Veteran Affairs Medical Center, we recruited HCPs who submitted incidents involving DDI(s). We conducted cognitive task analysis interviews with HCPs to examine DDI incidents in depth. We completed an inductive, qualitative analysis of interviews to identify informational cues and barriers to DDI management. Data informed a descriptive model of HCPs’ decision-making processes for DDIs.

Results: We analyzed 21 incidents (85% outpatient) and completed interviews with 10 pharmacists, 10 physicians, and 1 nurse practitioner. When encountering unfamiliar DDIs, HCPs collectively noted five information cues that aided their decision-making: confirmation that the DDI alert is clinically valid; DDI mechanism; degree and types of clinical risk; whether the DDI can be mitigated through dose adjustments; and implications for the patient if continuing both medications. We identified four barriers to DDI management: challenges detecting DDIs, including DDI alert fatigue and design; conflicting information across DDI reference sources; limited therapeutic alternatives; and uncertainty about relevant patient characteristics (eg, patient’s ability to monitor for DDI symptoms). DDIs that involved combination medications were especially challenging for HCPs to manage.

Conclusions: This research describes the DDI decision-making process in a complex, clinical setting. Although HCPs sought to minimize DDI risk, they were still challenged by conflicting information, uncertainty about alternative options, and the DDI alerting process itself. Results provide an important foundation for improving work systems and enhancing computerized clinical decision support.

Findings may also be used in curricula to better prepare pharmacy students and other trainees for DDI management in clinical practice.

Insights from an Active-Learning Exercise Integrating Formulary Decision Making with Clinical Decision Support System
Anna Dushenkov, Fairleigh Dickinson University, Julie Kalabalik-Hoganson, Fairleigh Dickinson University.

Objective: To assess students’ knowledge and skills in converting formulary decision into medication use in practice via development of clinical decision support (CDSS) tools, an area in pharmacy practice education lacking “how-to” guidance.

Methods: Seventy P2 students participated in a 3-class activity: (1) mock P&T committee deciding on edoxaban addition to formulary; (2) interactive lecture on CDSS as technology-driven communication tools to implement formulary decisions, and assignment to explain formulary decision rationale in preparation for the third class; (3) application of pharmacy informatics to execute formulary decision. Assessments included individual Pollev where responses and group submissions of CDSS examples.

Results: Students’ baseline knowledge of the term “formulary” was correct in 91% of responses. From the assignment, 51% of students correctly identified 2 of 3 criteria (efficacy and safety) for addition of edoxaban; 43% identified 1 of 3 criteria (safety mostly). All 3 criteria were identified by 1.4% of students. “Restricting” as a means of cost containment was grasped by 87% of students. All students created a correct example of passive CDSS; 95.7% supported it with the correct rationale. Whereas, 22% created a correct active CDSS; 87% supported it with the correct rationale.

Conclusions: This integrated active-learning exercise demonstrated students’ strong understanding of formulary decision-making and their ability to create passive CDSS, construction and functionality of which is easily understood with illustrations. Students’ weakness in designing active CDSS was observed. Real-life demonstrations may enhance appreciation of active CDSS functionality and application. Creation of CDSS within existing simulation electronic health records may be a useful solution to the problem. Incorporation of hands-on informatics activities in both didactic and experiential curriculum is highly desirable.

Integrating Interprofessional Learning and Collaboration: Linking Pharmacy and Veterinary Medicine
Jared Van Hooser, University of Minnesota, Nichole M. Rupnow, University of Minnesota, Morgan K Stoa.

Objective: To design, implement, and evaluate an interprofessional patient care activity involving pharmacy
and veterinary medicine students at the University of Minnesota. **Methods:** Interprofessional (IP) teamwork is necessary for optimal patient care. Second year pharmacy and third year veterinary medicine students worked together to work through four scenarios requiring teamwork to develop IP skills to discuss multifaceted cases. Students were given a six week period to complete out of class requirements including: case review (discipline specific discussions), interdisciplinary group discussion, and a group written submission. A survey was distributed to collect student feedback and satisfaction. A 5 point Likert item was used to measure students’ responses to prompts: disagree, somewhat disagree, neutral, somewhat agree, agree. Short answer questions were to gather student feedback. **Results:** A total of 256 individuals completed the survey (n=159 pharmacy students (PS), n=97 veterinary medicine students (VS)). Over 73% of PS and VS agreed or somewhat agreed with the statement, “I learned more about the connection between pharmacy practice and veterinary medicine practice”. Over 84% of PS and 73% of VS agreed or somewhat agreed with the statement, “I found value in learning from other healthcare professional students”. Over 81% of PS and VS agreed or somewhat agreed with the statement, “I feel prepared to interact with other healthcare professionals”. **Conclusions:** As pharmacists and veterinarians may likely experience opportunities for collaboration in practice, designing an activity with clinical application that draws on the availability of two professional programs is novel and desirable. Students received the activity positively and found value in the learning experience. Using technology and out of class time allowed us to overcome barriers, bringing together two disciplines across three campuses.

**Integrating the National HIV Curriculum into a Didactic Curriculum for Second Professional Year Pharmacy Students**

Katherine Perry, Cedarville University, Aleda M. Chen, Cedarville University, Zachary N. Jenkins, Cedarville University, Joel Sweeney, Cedarville University, Zachary J Krauss.

**Objective:** Pharmacy schools around the nation face a need to educate student-pharmacists to effectively treat patients with HIV by improving their knowledge, perceptions of patients with HIV, and confidence when managing patients with HIV. Thus, the purpose of this study was to evaluate the effectiveness of the National HIV curriculum (NHC) on professional pharmacy students’ knowledge of HIV treatment and confidence when treating patients with HIV. **Methods:** Until 2020, HIV was taught using traditional resources as a subject in the Infectious Disease and Immunology II (ID II) course for second-year professional (P2) students at this institution. The NHC was integrated into the curriculum in the 2019-2020 academic year using various pedagogies, such as peer instruction and patient simulation, across 5, 2-hour sessions. A questionnaire was developed and distributed to pharmacy-faculty participants in the NHC curriculum for review. The survey was distributed to P2 pharmacy students pre-ID II module and at the completion of the NHC week of the module (after exam completion). **Results:** Of the 44 students enrolled in the course, 34 students completed the pre-survey and 22 students completed the post-survey. 72.7% of students indicated that the NHC increased their confidence caring for patients with HIV. The differences between pre-survey and post-survey were significantly improved for all items (p<0.05). When exam performance from 2020 was compared with 2019, a greater percentage of students answered 2020 exam questions (97%) correctly than 2019 (92%). **Conclusions:** The National HIV curriculum is a useful tool for pharmacy faculty to increase student confidence related to HIV-medication counseling. The curriculum also seems to improve student performance on exams. Future studies should explore best practices in utilizing this content within the classroom.

**Integration of the Pharmacists’ Patient Care Process in a Case-Based Pharmacotherapy Elective**

Sara K. Richter, St. Louis College of Pharmacy, Rachel P Marchi, Meghin Moynihan, St. Louis College of Pharmacy, Suzanne Bollmeier, St. Louis College of Pharmacy.

**Objective:** To evaluate whether participation in a case-based elective enhances confidence related to understanding/participating in the Pharmacists’ Patient Care Process (PPCP). **Methods:** An elective, focused on applying knowledge from Integrated Pharmacotherapy (IP) Pulmonology and Cardiology, was offered to professional-year two (P2) and three (P3) students in fall 2019. New content was not introduced; rather, information from the IP courses was applied and evaluated using a simulated electronic health record (EHR), SOAP note writing, and a faculty-developed rubric aligned with the PPCP. Professional-year two students were enrolled in the elective and IP courses concurrently, while P3 students completed these IP courses last year. Confidence was reported on an 11-point Likert scale via pre-post surveys. The primary outcome, analyzed using Mann-Whitney U, was the end-of-semester difference in confidence related to understanding/participating in the PPCP between students enrolled in the elective and those not enrolled. **Results:** Three hundred twenty-eight students completed both the pre- and post-surveys (79% response). There
were no differences in baseline characteristics between groups. At semester-end, students enrolled in the elective (n=48) felt significantly more confident about their understanding/ability to participate in the PPCP compared to students not enrolled (n=280) (7.1 vs 6.4 on Likert scale). Additionally, students in the elective reported significantly higher levels of confidence in utilizing EHRs (8.3 vs 7.4) and documenting/communicating care via SOAP notes (8.6 vs 7.6). More P2 students enrolled in the elective earned grades of A or B in IP: Pulmonology and Cardiology courses compared to P2 students not enrolled (78% vs 69%). Conclusions: Participants in a case-based elective reported more confidence in understanding the PPCP, utilizing EHRs, and communicating via SOAP notes. The elective may also contribute to higher academic performance.

Interprofessional Patient-Centered Approach to Medication Management in Mental Health
Kathleen J. Pincus, Megan Ehret, University of Maryland, Erica Rosen, University of Maryland Family Medicine. Objective: The objective of the study is to compare pharmacy and social work student’s readiness for Interprofessional Learning and Attitudes Towards HealthCare Teams prior to and after participation in a course, Interprofessional Patient-Centered Approach to Medication Management in Mental Health. Methods: The course is an elective 1-credit course, where pharmacy students and social work students worked collaboratively to explore issues related to optimizing medication management for patient with mental health disorders. Two surveys evaluated the student’s readiness to participate in this endeavor and their attitudes towards working in this type of interprofessional team - Attitudes Toward Health Care Team Scale and Readiness for Interprofessional Learning Scale. Students’ responses were analyzed using descriptive statistics and paired t-tests. Results: Twenty-five students participated in the survey (N=17 were matched). Four questions were significantly different pre and post class: Working on a team keeps most health professionals enthusiastic and interested in their jobs (p=0.009), developing a patient care plan with other members avoids errors in delivering care (p=0.031), health professionals working on teams are more responsive than others to the emotional and financial needs of patients (p=0.018), and I am aware of my own personal strengths and weaknesses (p=0.049). Conclusions: With the current discussion of provider burnout and increasing shortage of mental health care providers, treatment teams are increasingly needed. The course helped provide a framework for a course to develop necessary skills in treatment teams. Many lessons were learned and students confirmed the need for increased treatment teams to care for patients with mental health diagnoses.

Knowledge and Attitude Assessments Before and After Implementation of a Substance Use Disorder (SUD) Certificate
Casey Fitzpatrick, Marshall University, Charles Babcock, Marshall University, Brittany L. Riley, Marshall University, Kimberly A. Broedel-Zaugg, Marshall University. Objective: To investigate if a SUD certificate program provided to pharmacy students alters knowledge and attitudes regarding SUD and SUD treatment. Methods: A 25 question pre- and post-assessment was administered to P3 pharmacy students in two separate electives to assess their knowledge regarding: the SUD disease model, screening and assessment of SUD patients, managing withdrawal and complications of substance use, and effective treatment strategies for SUD. Additionally, a 33 question pre- and post-survey was given to assess students’ attitudes toward SUD. For each survey statement, a 5-point Likert scale was used ranging from 1 (strongly disagree) to 5 (strongly agree). Results: Scores from the knowledge assessment increased in the post-assessment for 27/28 students. A statistically significant difference was seen between mean pre-SUD module scores 74.8 (range 28% - 88%) and mean post-SUD module scores 90.7 (range 84% - 100%) (p-value <0.05). From the attitude survey, a statistical increase was found for the statement “Those with opioid use disorder should have access to Vivitrol treatment (3.89 to 4.5, p-value = 0.01).” A significant decrease was found for the statement “People choose to become addicted (2.21 to 1.63, p = 0.05).” Other statements showed trends of difference but were not statistically significant. Conclusions: Based on results from the two pilot groups, it appears that the SUD certificate improved participant knowledge. Attitudes were slightly softened on SUD being a choice and increased approval of Vivitrol as a treatment choice. In the future, this program needs to aid participants to develop an understanding and application of the knowledge gained in order to effect participant attitudes of SUD.

Longitudinal Educational Aptitude Development: Taking the LEAD on Curricular Relevance – Faculty Perception
Jenny A. Van Amburgh, Northeastern University, Debra A. Copeland, Northeastern University, Michael J. Gonyeau, Northeastern University.
Objective: Student surveys have revealed a growing ambivalence about perceived relevance of foundational coursework. We identified a need to develop connections to assist students with understanding relevance of foundational courses. Current efforts across the academy remain fragmented and literature presents more theoretical models than actual studies. This project was created in attempt to gain a better understanding of faculty views regarding the relevance and value of knowledge, skills and attitudes delivered in foundational courses in the Doctor of Pharmacy program.

Methods: A 16-question (matrix table and open-ended responses) Qualtrics survey was sent to School of Pharmacy faculty that probed relevance, value and advice to students on 4 different courses (immunology (I), biochemistry(B), pharmacology/medicinal chemistry (PMC), pharmacokinetics (PK), and pharmaceutics(PC)) related to courses taught later in the curriculum. IRB was exempted due to the CQI design.

Results: Responses totaled 27 (60%), with a preponderance from practice faculty (85%). Strong correlations were found between B to I (67%) and anti-infectives (56%), PMC was strongly correlated by >90% of respondents with all courses evaluated, PC correlated with PK (73%), and PK correlated with PMC (67%), PC (64%) and therapeutics (67%). Comment trends highlighted two main themes: need to add clinical application exercises to foundational courses for context and relevance to students, and to focus on skills in foundational courses instead of knowledge and memorization. Conclusions: Faculty highlighted the importance of PMC as a foundation course to all other courses in the curriculum and to pharmacy practice. These results are being shared with all faculty in the SOP as well as our curriculum revision taskforce to further discussions for enhanced curricular integration and efficiency.

Longitudinal Educational Aptitude Development: Taking the LEAD on Curricular Relevance – Students Impression

Michael J. Gonyeau, Northeastern University, Debra A. Copeland, Northeastern University, Jenny A. Van Amburgh, Northeastern University.

Objective: AACP graduating student survey responses have suggested a growing ambivalence about perceived relevance of foundational coursework in the provision of patient care. We identified a need to develop connections to assist students with understanding importance/relevance of foundational courses. Current efforts across the academy remain fragmented and literature presents more theoretical models than actual studies. This project describes students’ impressions about connections between pre-pharmacy, foundational pharmaceutical sciences, and pharmacy coursework. Methods: P2-P4 students (n=359) were sent a Qualtrics survey consisting of 28 questions (matrix-table and open-ended responses). The survey probed student perceptions of relevance, value and advice to faculty/students regarding 4 courses (biochemistry(B), pharmacology/medicinal chemistry (PMC), pharmacokinetics (PK), and pharmaceutics (PC)) related to courses taught later in the curriculum. IRB was exempted due to the CQI design.

Results: Responses totaled 201 (56%) P2-P4 students with equivalent representation from each class. Perceived relevance of courses(R) and application to practice(A) varied, with PMC achieving the highest scores (R=3.63+/-.05, A=3.64+/-.05) and B the lowest (R=2.29+/-.09, A=2.26+/-.09). The majority of respondents stated their opinions of courses did not change as they progressed through the curriculum, although PMC was equivocal (no=52%, yes=48%). However, upon reflection, 59% stated they would change their approach to learning knowledge, skills and attitudes in foundational courses. How students would alter their learning approach focused on staying up to date, studying to retain information long term, not just for the assessment, and focus on the “big picture” of how courses relate to professional development. Conclusions: These results are being shared with all faculty and students in the SOP as well as our curriculum revision taskforce to further discussions for enhanced curricular integration and efficiency.

Measuring the Impact of the Pharmacy Practice Section Mentor Program

Meredith L. Howard, University of North Texas Health Science Center, Seena L. Haines, The University of Mississippi, Kristi W Kelley, Auburn University, Rebecca Schoen, Duquesne University, Susan E. Smith, The University of Georgia.

Objective: To describe the demographics of mentors and mentees enrolled in the inaugural program cohort and report outcomes achieved at the midpoint assessment.

Methods: The mentor/mentee match process and initial capture of demographic information occurred in May 2019. Mentor and mentee matches were initiated in June 2019, prior to the AACP annual meeting. In December, a 14-item Qualtrics instrument assessed metrics related to goal-setting and achievement, discussions relating to teaching, scholarship and service, career guidance, rapport, and opportunities for programmatic improvement.

Results: Fifty-two mentees were matched to 39 mentors (1:1 or 2:1). Overall, 80% of mentees and 67% of mentors
were female. Most mentees were assistant professors (90%), whereas 51% and 31% of mentors were associate and full professors, respectively. The majority of participants were non-tenure track clinical faculty. Mentors identified various combinations of needs at the start of the program including didactic teaching, precepting, Scholarship of Teaching and Learning, and clinical practice. Twenty-one mentees and 17 mentors completed midpoint assessments. Over 80% of mentees agreed or strongly agreed that mentors provided valuable guidance and that they were making progress towards goals. A total of 65% of mentors responded that mentees were progressing towards goals. Over 75% of mentors indicated the mentorship program is well structured and that they gained confidence as a mentor. Conclusions: The inaugural program has provided 52 mentees with mentorship opportunities. The majority of mentors and mentees agree mentees are progressing toward their mutually agreed upon goals. Plans are underway for year two of the program and the inaugural cohort will be reassessed in June 2020.

“Meet Your Neighbors”: An Interprofessional Reflective Activity for First Year Health Profession Students
Philip T. Rodgers, University of North Carolina at Chapel Hill, Jackie M Zeeman, University of North Carolina at Chapel Hill, Mollie A. Scott, University of North Carolina at Chapel Hill, Thomas Koonce, UNC School of Medicine, Meg Zomorodi.
Objective: Interprofessional education (IPE) is a key component in health professions education to prepare students for practice. The purpose of this study was to evaluate first-year health professional students’ self-efficacy for select IPE collaborative (IPEC) competencies after participation in an IPE reflective exercise. Methods: All first-year pharmacy, medicine, dentistry, and nursing students (n=580) participated in a required exercise to "learn from, with, and about" themselves as members of a healthcare team and the role of other professionals as team members. Students wrote an individual reflection on motivations for pursuing their profession and its impact on healthcare. A pre-activity survey using a 6-point self-efficacy scale assessed student confidence on select IPEC competencies. Students were then assigned to an interprofessional group of 3-5 students. Each student read their reflections to the group, and discussed the similarities and differences of their reflections. After the discussion, students wrote a collective reflection on what they learned from meeting with the other health profession students. A debrief was held with the students and a post-activity survey was administered. Results: The post-activity survey showed improved confidence across all IPEC competencies surveyed. Specifically, students’ confidence improved in explaining roles and responsibilities (pre: 44.3%; post: 86.8%) and describing how professionals can collaborate and integrate on interventions (pre: 50.5%; post: 90.5%). Confidence in communicating roles (pre: 63.9%; post: 89.1%) and forging interdependent relationships (pre: 59.6%; post: 88.5%) also improved. Conclusions: Students’ appreciation of other health professions and confidence in interprofessional interactions improved after participating in the IPE exercise. Participants valued the opportunity to learn from, with, and about each other. The exercise provided a unique method to engage learners in IPE prior to clinical matriculation.

Moving Beyond Evaluation to Coaching; Advancing Mid-Career Practice Faculty
Anne M. Schullo-Feulner, University of Minnesota, Jean Y. Moon, University of Minnesota, Kristin K. Janke, University of Minnesota.
Objective: Objectives were to identify the essential elements of a peer coaching program and outline outcomes. Methods: Practice faculty participated in a 2 hour, active learning, expert-led coaching training session. For the peer coaching sessions, randomly selected groups of 3 rotated between 3 roles: “coach,” “coachee,” and “recorder.” Pre-reflections helped self-identify “areas of concern/growth,” including goals, needs and challenges. Post-reflections assisted faculty in debriefing on the experience itself through WOW questions, as well as prompting faculty to set a SMART goal. Faculty response was assessed using deductive coding based on Haji’s 7 Evaluation Essentials. Results: Twenty out of 21 practice faculty completed all steps of the peer coaching process. Fifty percent of faculty chose a practice issue as their “area of concern/growth,” while 30% chose “scholarship.” All 20 faculty created at least one measurable, time-bound SMART goal. In 3 months time faculty reported an average of 45% (10%-95%) of SMART goal completion. Ninety-four percent of faculty would be willing to repeat the peer coaching process with 82% agreeing that this process provided more support and community than previous “peer evaluations.” Faculty response themes included: motivation and inspiration toward self-identified goals, a sense of community and connection, and finding coaching to be an emotional and difficult endeavor. Conclusions: With minimal training, moving from a peer evaluation to coaching model was able to foster a sense of community while advancing mid-career faculty development through: establishment of self-selected “growth areas,” creation of SMART goals and
significant progress toward completion of the goal (45%) within 3 months. Additionally, collating faculty “growth areas” can provide leadership with programmatic change ideas.

Multi-School Simulation to Improve Student Skills Providing Remote Pharmacy Services
Andrea L. Porter, University of Wisconsin-Madison, Jeanne E. Frenzel, North Dakota State University, Magdalena M. Siodlak, Isabella Kotarski.

Objective: To develop and assess a learning experience for third-year student pharmacists at two schools of pharmacy focused on improving student skills and confidence in providing remote pharmacy services. Methods: Third-year students enrolled in Integrated Pharmacotherapy Skills III at the University of Wisconsin-Madison and Pharmacy Practice Laboratory IV at North Dakota State University in the fall 2019 semester completed three prescription verification telepharmacy interactions, playing the roles of pharmacy technician and pharmacist. One error was embedded in each set of prescriptions. Students completed a survey at baseline and after the activity, as well as post-activity reflection questions. Descriptive statistics and thematic analysis were used to evaluate the data. Results: Eleven students from each school connected using audio and video technologies to verify the dispensing of two oral medications and the compounding of one injectable medication. Five students (22.7%) had prior telepharmacy experience. The embedded error was identified by all students. After the activity, the majority of students felt fairly to very confident in completing a final product verification of a compounded sterile product (64%) and prescription medication (86%) using telepharmacy technology. The students between the two schools enjoyed the opportunity to communicate and learn with students at a different site.

Conclusions: This project supports the use of simulation to improve student confidence in their abilities to provide telepharmacy services. It also illustrates how two schools can collaborate to complete an educational research project to assess student skill performance. Future directions include additional telepharmacy activities and expansion to a full cohort of students.

Open Up and Say Ahh: An Interactive SLP/Pharmacy Student Lab Highlighting Oral Care
Melissa Shipp, Harding University, Melanie Meeker, Harding University College of Allied Health.

Objective: Participants will discuss pharmacists’ contribution to oral care in persons served. Participants will refine ability to implement a similar interprofessional patient care experience in their own settings. Participants will describe objectives taught in interprofessional session, recognizing the value of interprofessional education to achieve those objectives. Methods: Following a brief faculty introduction to the lab, students rotated through a series of four stations where they exchanged knowledge and completed a crossword puzzle as a team using the knowledge they acquired. Hands-on activities invited them to explore concepts related to the day’s learning objectives. Current findings in literature were provided. Students were invited to test a variety of products used for oral hygiene and discussed the pros and cons of each method. At another station, students were invited to sample a variety of thickened liquids. Discussion on thickened liquids and possible unintended consequences of modified diets were presented. A third station provided an opportunity to try different mouthwashes. Students learned about ingredients that promote mucosal drying and explored the impact of poor lip seal on mouthwash use. The fourth station provided samples of moisture-facilitating products; examples of patient populations who may benefit from these products were presented. Results: Pre- and post-test quizzes were given. Quantitative results indicated that students’ knowledge improved as a result of the lab. Qualitative results demonstrated that students from both disciplines perceived value in the experience, recognizing the role of their own and another’s discipline in provision of good care. Conclusions: Students enjoyed interacting with those from other health disciplines, both teaching to and learning from each other. Common responses included mentioning of having greater empathy and understanding for patients and what is endure.

Pass/Fail or A-F: Measuring Changes in Stress and Motivation in a Laboratory Skills Course
Morgan K Stoa, Jared Van Hooser, University of Minnesota, Nichole M. Rupnow, University of Minnesota.

Objective: To evaluate the transition from A-F grading to a pass-fail grading system in the pharmacy skills lab sequence including student perception and student performance data.

Methods: A survey was developed to assess students before and after the change of grading construct from A-F to pass/fail grading. Four question areas were developed: extrinsic/intrinsic goal orientation, pressure/tension, interest/enjoyment/curiosity/competition, and engagement. Second year pharmacy students were assessed before and after the system change. Results: Students completed the survey before implementation of pass/fail (2018, n=120) and after pass/fail implementation (2019, n=161). Percent positive responses for students feeling that the lab environment allows them to learn from their mistakes increased from 68.8% in that A-F rating system to 74.5% in the pass/fail rating system. Additionally, 87.1% of students felt very anxious...
while doing lab activities which decreased to 70.8% when a pass/fail rating system was instituted. Curiosity, and interest measures also increased in a pass/fail course compared to A-F. Working for an above satisfactory rating motivates me to prepare more thoroughly for the lab decreased from 67.6% in A-F to 43.5% in pass/fail. Conclusions: Students feel less stressed in a pass/fail graded laboratory course than in a previous A-F grading scale. Additionally, the need to achieve beyond the satisfactory rating was noted to decrease with the change to pass/fail grading. Additional investigation will be needed to determine an incentive measure to increase student motivation for above satisfactory ratings. Optional surveys were administered in the first- and third-year laboratory courses to gauge students’ attitudes with the rating system over time and future research could investigate between class year differences.

Patient Perspectives: A New Course About Patients’ Experience with Disease Management and Treatment
James W. McAuley, The Ohio State University, Andrea Haugtvedt, KELLY SPEIRS, Zachary T Woods, The Ohio State University, Nicole Kwiek, The Ohio State University.
Objective: To describe the inception and details of a course where students learn directly from patients.
Methods: Years of practice has reinforced the notion that patients have much to teach healthcare providers. The Ohio State University College of Pharmacy has invited patient speakers into classrooms for students to learn directly about the patient experience for many years. Pursuant to this long-standing tradition, an undergraduate elective course was developed to provide students with the unique opportunity to learn about the impact disease states and therapies have on patients and their support persons. Course objectives are to identify how patients’ disease states and therapies affect their lives; empathize with different patients students may encounter as a healthcare provider; explain general disease state epidemiology and pathophysiology; and analyze how disease states and therapies affect their lives. Interspersed between the patient speakers are sessions addressing key topics surrounding the patient experience, including medication cost, activities of daily living, stigma of disease and access of care. Students are graded on attendance, pre-class work, and post-class reflections. Results: For this first course offering, we enrolled 19 students from various undergraduate majors, but primarily pharmaceutical sciences. The class actively engaged in meaningful discussion each week followed by thoughtful post-class reflections showing an increase in understanding and empathy. Conclusions: Through engaging with patients and their support persons, this course has allowed students to develop their understanding for the patient experience and demonstrate empathy.

Pharmacists and Performance Impact of Electronic Health Record-Based Patient Cases in a Critical Care Elective Course
Elizabeth Scanlon, Brittney Duewell, Ann Parks, Concordia University Wisconsin, Sarah R. Peppard, Concordia University Wisconsin.
Objective: With nearly-universal use of EHRs in healthcare, exposure to EHR software in didactic curriculum may increase student preparedness upon transitioning to clinical practice. The objective of this study is to investigate the impact of EHR-based patient case assignments within a pharmacy school curriculum on students’ performance and perceptions. Methods: EHR-based cases were utilized for two of the four patient case assignments in a P3 critical care elective course. The impact of the EHR on student performance was measured by comparing grades between EHR-based and paper-based patient case assignments. A questionnaire evaluated student’s perceptions of EHR-based cases. Time to completion of EHR and paper-based case assignments were compared. Results: There was no difference in student performance between EHR and paper-based patient case assignments (88.38% vs 90.29%, respectively; p = 0.203). A total of 19/27 (70%) students enrolled in the class completed the questionnaire. A majority (84%) of respondents felt confident in their abilities to locate information in an EHR at the end of the course. Over half of respondents indicated that EHR cases provided a more realistic experience (63%) and increased their confidence in the clinical setting (53%) compared to paper-based cases. 74% indicated the EHR-based cases took longer to complete; however, the mean difference in time to completion of EHR and paper-based cases was 2.9 and 2.4 hours, respectively (p = 0.019). Conclusions: Incorporation of EHR into a critical care elective course did not show a difference in student performances on patient case assignments. EHR patient case assignments did, however, increase students’ perceptions of clinical preparedness, despite a perceived increase in time to completion of these cases.

Pharmacist Interventions in Improving Clinical Outcomes Through a Collaborative Ambulatory Care Pharmacy Practice (CAPP) Approach
MokThoong Chong.
Objective: To evaluate the impact of pharmacist’s interventions through a Collaborative Ambulatory Care
Pharmacy Practice (CAPP) model in patients with type 2 diabetes mellitus (T2DM) among the under-represented population. **Methods:** Eligible patients were 18 years and older with a diagnosis of T2DM with or without comorbid cardiovascular disease risk factors. Patients were enrolled through routine primary care provider referrals. During a one-on-one, face-to-face scheduled clinic visit, the pharmacist provided a Comprehensive Medication Management (CMM) by reviewing vital signs and laboratory values; provided medication reconciliation and management; followed by medication counseling through a CAPP approach in a primary care setting. The pharmacist worked in close collaboration with the primary care provider to intervene on medication therapy through recommendations to initiate, adjust, modify, or discontinue drug therapy; and order laboratory tests and drug concentration levels as appropriate. Each visit was documented as a “PharmD Progress Note” in patient’s electronic medical record. Follow-up visits were scheduled until patients’ targeted treatment goals were achieved. Primary and secondary outcome data were collected and then analyzed. **Results:** Forty-seven patients were seen by a pharmacist over a period of twelve months. Sixty-four percent of the participating patients were able to achieve targeted treatment goals. A statistically significant decrease in the mean change in hemoglobin A1c (HbA1c), diastolic blood pressure (DBP), fasting blood glucose (FBG) and triglycerides (TGs) levels were observed from baseline which were -2.3%, -7.75 mmHg, -76.1 mg/dL, and -55.5 mg/dL respectively. No significant changes in other clinical outcomes were observed. **Conclusions:** The CAPP Model demonstrated significant reduction in clinical endpoints in patients with T2DM among the high risk under-represented population.

**Pharmacy Students Perspectives on Prescription Renewal Request Review Activity on Ambulatory Care Rotations**

Jarred B Prudencio, *University of Hawaii at Hilo*, Michelle Kim, *University of Hawaii at Hilo.*

**Objective:** To assess the impact of a learning activity for fourth-year pharmacy students on ambulatory care advanced pharmacy practice experiential (APPE) rotations. **Methods:** APPE ambulatory care students at the Hawaii Island Family Health Center were tasked with reviewing prescription renewal requests received from community pharmacies. Upon receiving a request, students reviewed the patient’s electronic medical record to assess the medication for safety, efficacy, and overall optimization. After reviewing, students forwarded the request to the patients primary care physician, accompanied by any recommendations to optimize the medication, including ordering labs, dose adjustments, or changing quantities. Students performed this responsibility in the clinic each day after the direct patient care appointments. Upon completion of the rotation, students completed an anonymous survey to assess their opinions on this activity as a learning tool. **Results:** Twenty total APPE students rotated through this clinic and completed the post-rotation survey. Of these students, 95% reported that participating in this activity helped improve their confidence in verifying prescriptions for safety and efficacy. Additionally, 90% of the students said that by the completion of the rotation, they were confident in making recommendations to physicians and would be able to take what they learned with this activity and apply it to other pharmacy settings. Lastly, 80% of students reported that this activity helped them learn appropriate monitoring parameters for specific prescription medications. **Conclusions:** Prescription renewal review in a family medicine clinic was a worthwhile learning activity for APPE students. This simulated the process of verifying prescription orders and allowed students to reinforce monitoring parameters for safety and efficacy of medications.

**Pre and Post-Survey of Interprofessional Education Event**


**Objective:** To describe and evaluate the impact of an interprofessional stroke simulation delivered across three campuses with six types of professional students. **Methods:** An interprofessional stroke simulation delivery was completed with medical, nursing, physician assistant, occupational therapy, pharmacy, and physical therapy students across multiple sites. Prior to the activity, demographic information and interprofessional history was requested from all students via a Qualtrics delivered survey. This 6-item survey collected age, gender, discipline, year in respective program, number of experiences in prior interprofessional events, and comfort level working with other healthcare professionals. The survey was repeated after the session, utilizing the previous questions but also gathering whether learners gained information to learn how to work together, if they learned about the roles of other healthcare workers, and if they found the stroke simulation session to be useful. Descriptive statistics were utilized. **Results:** Overall, 463 healthcare professional students completed the simulation activity. Of those students, 172 (37% response rate) completed the pre-survey and 292 completed the post-survey (63% response rate). Medical students accounted for 80% of the completers, followed by pharmacy students (10%), and then nursing, medical assistant, occupational therapy, and PA students (10% each). Most students felt that learning about the roles of other healthcare workers was helpful and that the activity was useful. Students were also asked about the usefulness of the simulation for safety, efficacy, and overall optimization, and the majority of students reported that the simulation was valuable for learning about the roles of other healthcare workers. **Conclusions:** The interprofessional stroke simulation was effective in providing learners with an understanding of the roles of other healthcare workers and in reinforcing the importance of collaboration in the delivery of care.
for the majority of pre-survey respondents (55%) and pharmacy students were the majority respondents in the post-survey (37%). From the post-survey results, 83% of participants either strongly agreed or agreed that they learned how healthcare disciplines can work together. Also, 75.3% of participants felt more comfortable working with learners from other disciplines as compared to the baseline result, with 56.4% of respondents rating themselves as comfortable. Conclusions: Multidisciplinary sessions with professional students is beneficial for learning new information about other professions and growing comfort levels in working with interdisciplinary groups.

Predictors of Students’ Performance in a Neuropsychiatric Course in an Accelerated Pharmacy Program
Rajkumar J. Sevak, University of the Pacific, Robert F. Halliwell, University of the Pacific.
Objective: Mental illness can be associated with cognitive deficits; however, its impact on pharmacy students’ academic performance is not fully understood. Also, little is known about pharmacy students’ previous clinical experience with psychiatric patient care on their performance in a neuropsychiatric course. This study investigated whether self-reported mental illness or previous experience with psychiatric patient care affected pharmacy students’ scores on the final exam of a neuropsychiatric course. We also evaluated whether student’s performance in case-based tests predicted their performance in the final exam. Methods: The 2nd year pharmacy students (n=201) self-reported their mental illness and/or their experience with psychiatric patient care in a short survey. Within the course, students completed two case-based tests, separated by three weeks. Each test included 2 patient cases with 10 multiple-choice questions (MCQs) per case. The final exam, conducted 2 weeks after the second case test, included 65 MCQs. A multiple linear regression analysis evaluated the effects of students’ mental illness, psychiatric patient care experience and performance in small case-based tests on their final exam scores. Results: Outcomes from the multiple regression indicated the model explained 17.8% of variance and was a significant predictor of final exam scores (F6,194 = 6.98, p<0.000001). After controlling for age and gender, scores on two case-based tests significantly predicted student performance (B1=0.336, B2=0.124, p < 0.005), whereas student mental illness or psychiatric patient care experience did not predict performance in the final exam (B3=0.012, B4=0.0001, p > 0.49). Conclusions: These findings indicate that student performance in patient case-based tests, but not their mental illness or psychiatric patient care experience, predict performance in a neuropsychiatric final exam.

Preliminary Assessment of Choose Your Own Adventure Patient Case Format
Tyler M. Kiles, The University of Tennessee.
Objective: The objective of this study was to preliminarily assess student perceptions of an innovative educational activity. Methods: A Choose Your Own Adventure (CYOA) activity was designed to develop critical thinking skills for second-year PharmD. students. A traditional paper patient case regarding outpatient diabetes management was transformed into an interactive format utilizing Microsoft Powerpoint. Hyperlinking was added to the presentation slides so that once a student selected a clinical decision, the student was routed to another slide describing the outcome of that choice. Each outcome slide provided an explanation as to why or why not that decision was the most correct choice. There was only one series of choices that eventually led to the most positive patient outcome. Students worked in pairs until coming to a stopping point for group discussion. After the activity, the students were invited to participate in a brief online survey to capture their opinions of the activity. Results: Approximately 4 hours of faculty time was dedicated to develop the patient case in CYOA format. The activity was delivered over 50 minutes. Sixty-seven students completed the post-survey (RR = 33%). Most respondents preferred the CYOA case presentation style to traditional paper cases (n = 57, 85%) and wanted to see more cases in CYOA format (n = 56, 84%). Students also expressed that the CYOA activity increased their knowledge (n = 62, 93%), confidence (n = 60, 90%), and critical thinking skills (n = 56, 84%) regarding outpatient diabetes management. Conclusions: Students showed interest in the interactive CYOA patient case format. Future directions for this project include expansion to other therapeutic subjects, and further evaluations of critical thinking skills as well as examination outcomes.

Printed Posters Versus Digital Posters for Teaching and Learning
Lydia C. Newsom, Mercer University, Melissa M. Chesson, Mercer University, Susan W. Miller, Mercer University.
Objective: To characterize and compare pharmacy student perceptions of printed posters and digital posters as a strategy for teaching and learning. Methods: Student pharmacists presented and peer reviewed posters as part of didactic coursework. Students were randomly assigned to present and review a poster on an assigned topic in either digital format utilizing a tablet with an overhead
monitor or a printed poster mounted on a poster board. Perceptions of the two formats were characterized for two cohorts of students via pre- and post-activity surveys. Responses were compared using descriptive statistics and the Wilcoxon signed rank test. Results: The pre- and post-surveys were completed by 543 students (95.3%) and 553 students (97%), respectively. Student perceptions of posters for learning were positive, with over 95% of students noting the poster activity enhanced their knowledge of poster creation, helped them organize and critically evaluate scientific information, and improved their presentation and communication skills. The majority of students perceived the use of the digital format was straightforward (87.3%) and enhanced both the presentations (77.2%) and student learning (70.5%). The post-survey noted significant improvement in student perceptions of the utility of posters in learning pharmacy-related topics and in the number of students who preferred digital over printed posters (p<0.05 for both comparisons). Neither student perceptions regarding the utility of posters as a platform for learning nor student preferences for poster format were associated with age, gender, professional year, or tablet ownership at baseline. Conclusions: Poster presentations provide a platform for the dissemination and discussion of topics within a pharmacy curriculum and allow students to improve presentation and communication skills. Digital posters represent a convenient, alternative, and preferred presentation method for students.

QPR Gatekeeper Training for Suicide Prevention in a College-Aged Population: Is It Effective?
Erin McMahan, Emily B Vahary, Jamie Woodyard, Purdue University, Chelsea M. Baker, Purdue University, Storie P. Pedley, Purdue University, Kimberly S. Illingworth, Purdue University University.

Objective: Pharmacists are in a unique position to recognize and address suicidal thoughts and behaviors in their patients and colleagues. The objective of this study was to assess student pharmacists’ knowledge of suicide, recognition of suicidal thoughts and behaviors, and self-efficacy in addressing behaviors after implementation of a skills laboratory focused on suicide prevention. Methods: Second (N=149) and third (N=151) professional year students participated in a three-hour suicide prevention laboratory. Activities included: Question, Persuade, Refer (QPR) gatekeeper training, prompts for motivational interviewing practice, and patient- and peer-based role-plays. Pre- and post-surveys were administered to assess student knowledge of and confidence in addressing suicidal thoughts and behaviors, as well as confidence in communication skills. Three instruments were utilized: Suicide Intervention Training Assessment (9-items), QPR Assessment Instrument (9-items), and a Confidence in Patient Communication Skills Assessment (9-items). Wilcoxon signed-rank tests and paired t-tests were performed to assess change in students’ knowledge and confidence. Independent sample t-tests were performed to assess differences between professional years and prior QPR training. Results: One hundred twenty-seven second (85.2%) and 125 third (87.2%) year students completed both surveys. Overall, statistically significant improvements (P<0.001) were observed for all assessment items. No statistically significant differences in outcomes were noted between second- and third-year students. Students with prior QPR training had higher baseline values in knowledge and confidence (P<0.05) for all items. However, students improved on all assessment items regardless of prior QPR training (P<0.001). Conclusions: Students’ knowledge and confidence in recognizing and addressing suicide improved after exposure to a laboratory on suicide prevention. QPR training, or similar workshops, could be implemented for healthcare professional trainees so they can assist peers, patients and colleagues.

Quality Improvement Projects Designed and Implemented by Interprofessional Teams of Students 2013-2019
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Objective: To describe our program’s experience with creation and implementation of interprofessional student teams’ quality improvement (QI) projects within a clinical environment. The didactic methods used for instruction in QI and the types of projects that our students have undertaken are described. The sustainability and preceptor experience of this project based on survey data are also described. Methods: The Vanderbilt Program in Interprofessional Learning is a two-year long, clinically-based program involving pharmacy, social work, nurse practitioner and medical students. During the second year of the program, each team completes a QI project. We categorized seven years of improvement projects into the following: patient education/health coaching, improving no-show rates, improving clinic processes, screening tests, documentation, checkout/referral process, implementing social work evaluation into the work flow, and improvement of the patient experience. A survey was sent to clinic preceptors to gather data on the sustainability and
Reliability of a Modified Single-Point Rubric for Assessment of Integrated Pharmacotherapy Cases

Riley D. Bowers, Campbell University, Myrah Stockdale, Campbell University, Carrie N Baker, Brianne S. Raccor, Campbell University, Victor M. Pulgar, Campbell University, Kimberly E. Kelly, Campbell University.

Objective: Integrated cases in pharmacy curricula often incorporate disciplines such as pharmacology, physiology, medicinal chemistry and the clinical sciences. Grading integrated cases consistently with multiple faculty can be challenging. The purpose of this study is to describe the reliability of a newly developed single-point rubric for assessing integrated cases among interdisciplinary faculty graders. Methods: A single-point rubric was developed by an interdisciplinary team of faculty (n=4) in order to better provide students formative and summative feedback on existing integrated cases requiring written Pharmacists’ Patient Care Process (PPCP) notes. The rubric was calibrated retrospectively on a sample of deidentified cases from two cardiovascular/renal pharmacotherapy modules offered in the second professional year. During this initial calibration exercise, two basic science and two clinical science faculty reviewed each case. Following calibration, 17 submissions were evaluated by two of the previous faculty and two that did not participate in the initial calibration exercise. Evaluators included a medicinal chemist, pharmacologist, and clinical science faculty. To evaluate interrater agreement, a Fleiss’ kappa was calculated using SPSS. Results: Utilizing the modified single-point rubric, 17 PPCP notes were independently evaluated by four interdisciplinary raters. Fleiss’ kappa was run to determine if there was agreement between instructors’ judgement on the final grade classification of the 17 submissions. There was almost perfect agreement between the instructors’ judgements, κ = .868, 95% CI [.689, 1.047], p < .001. Conclusions: This study demonstrates the reliability of a modified single-point rubric to evaluate written cases involving multiple disciplines. The continued use of this rubric will allow both basic science and clinical science faculty to consistently grade assignments, decreasing assessment burden on individual instructors.

Retention of Students’ Ability to Incorporate a Computer into Patient Encounters During P4 Year

Sarah Ray, Concordia University Wisconsin, Hazel Thompson, Concordia University Wisconsin.

Objective: To assess if students previously instructed on incorporating computers into simulated patient encounters (SPE) retained the skill during patient encounters on their ambulatory advanced pharmacy practice experiences (A-APPEs). Methods: Students were required to utilize a computer to document clinical information gathered from SPEs in applied patient care skills labs in P2 and P3 years. Students’ performance during specific SPEs was evaluated by instructors with a rubric before and after receiving lecture-based instruction. A-APPE preceptors evaluated P4 students’ performance once based on the majority of patient visits observed. Students were evaluated on a scale of acceptable or needs improvement. Students’ self-reported attitudes and confidence toward computer use was also assessed pre/post instruction during P2 year, after both P3 semesters, and following the A-APPE. Results: Eighty-nine P2 students’ performance was evaluated. Acceptable student performance improved from pre-instruction (61%) to post-instruction (76%), p=0.029. Performance was retained during the P3 year. Among the 76 P4 students evaluated, 75% scored acceptable, p=0.118 compared to P2 pre-instruction. Additionally, students reported increased confidence and attitudes towards computer use compared to pre-instruction (all survey questions p <0.005, with the exception of being aware that using computers during a patient encounter can be a barrier to effective pharmacist and patient communication). Conclusions: Overall, students’ ability to utilize a computer and their confidence in that skill was retained over time. There were limitations to the P4 students’ performance evaluations. The A-APPE evaluation was a summative assessment of the student’s overall performance as opposed to one specific SPE, and not all P4 students were evaluated since they may not have utilized computers during the A-APPE.

Strategies for Assessing Global Health Education in the Classroom: A Systematic Review

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Maryland University, Michele Klein-Fedyshin, Abby A. Kahaleh, Roosevelt University.

**Objective:** The emphasis on global health in pharmacy education is growing, with schools developing courses, areas of concentration, and other didactic content. Organizations such as the Consortium of Universities for Global Health advocate for competencies in global health but do not provide evaluation tools. Evidence exists on the effectiveness of various educational strategies; however, there is a lack of standardization in assessment. The purpose of this study was to identify valid assessment tools for global health education in didactic settings.

**Methods:** A systematic review was conducted according to the PRISMA guidelines. The initial search was conducted using controlled vocabularies and syntax to screen PubMed, EMBASE, Global Health using Ovid, CINAHL and ERIC, from 1997 to September 2017. Included articles detailed health professions students, described a didactic educational intervention related to global health, and described assessment. **Results:** Of 9805 titles/abstracts identified, 398 full-text articles were reviewed, and 51 full-text articles were selected for qualitative synthesis. Most articles evaluated nursing students (23; 45%), followed by pharmacy (19; 37%) and medicine (17; 33%). Cultural competence (32; 63%) was evaluated most commonly, followed by health disparities (14; 28%). Most articles used quantitative assessment methods (41; 80%), most predominantly surveys (36; 71%). All tools assessed perceptions, attitudes and behaviors; fewer evaluated knowledge (23; 45%) and skills (14; 28%). The most common tool employed in studies was the Inventory for Assessing the Process of Cultural Competence (IAPCC). **Conclusions:** The majority of assessment tools focused on cultural competence. Particularly lacking were validated tools to assess student attitudes and skills in health disparities and global health. Having standardized, reliable, and validated tools is essential for advancing global health education.

**Student Engagement in an Active Learning Course Using Multi-Campus Team-Based Learning – Does Campus Matter?**
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**Objective:** The Ambulatory Care Elective at our college is taught using team-based learning across three campuses with one faculty facilitating for all sites using synchronous distance learning technology. The study objective is to compare student engagement in a multi-campus active learning course when the session is being facilitated from the student’s campus vs. a distant site. **Methods:** A self-reported student engagement instrument was administered three times during the course, once when the facilitator was at each campus. The final survey included Likert scale and open-ended questions to assess student perceptions of active learning across distant campuses. The primary outcome was student engagement scores compared using t-test. **Results:** The survey response rate was > 95%. There was a statistical difference in mean engagement scores when the faculty facilitator was on the same campus as the student (8.41, SD=3.11) vs. on a different campus (6.74, SD=3.56) p=0.007. When asked to rate engagement when the facilitator was on the same campus vs. a distant campus using a Likert scale (1=very disengaged, 5=very engaged), the mean score was 4.46, SD=0.78 vs. 3.09, SD=1.13 (p<0.001, n=46). There was a statistically significant difference in the mean Likert scale score (1=very uncomfortable, 5=very comfortable) of comfort in speaking in class if the facilitator is on the same campus (3.91, SD=0.96) compared to on a distant campus (3.24, SD=1.20) p<0.002. **Conclusions:** Students reported a higher level of engagement and greater comfort participating in class when the facilitator was on the same rather than a distant campus. These findings have implications for designing active learning across multiple campuses, including using faculty facilitators at each site and engaging distant students.

**Student Knowledge and Perceptions of the Role of the Pharmacist in Care Transitions**
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**Objective:** The objective of this study was to assess if the implementation of a new care transitions educational activity changed student knowledge and perceptions of the pharmacist’s role in care transitions. **Methods:** A care transitions activity, designed to demonstrate the transition of a patient from a hospital to an inpatient rehabilitation facility then to their first ambulatory care post-discharge visit, was implemented in the P2 skills lab and P3 Cappstone course at the University of New Mexico College of Pharmacy. The activity required students to review discharge orders, observe a live mock post-discharge ambulatory care clinic visit, conduct a “brown bag” review, and identify and resolve medication-related problems for a single patient in all three settings. Students completed a
Student Led Medication Reconciliation Program During Home Visits in a Public Health Elective Course

Nicolette M. Sifontis, Temple University, Terriann Dember, Lisa M. Becker, Temple University.

Objective: Temple Center for Population Health Transitions of Care Program (TCPH/TOCP) spearheaded by nurse navigators (NN) and community health workers (CHW) partnered with the School of Pharmacy in a structured service learning program, as part of a Public Health elective (PHE) course, which was offered to third professional year doctor of pharmacy students. This study evaluated the impact of student pharmacists on the medication reconciliation process during home visits with clients enrolled in TCPH/TOCP. This activity also offered an educational experience for students to practice patient interview techniques in a non-traditional setting and identify drug related problems. Methods: Clients were screened by a NN and then referred to a CHW/student pharmacist team. The team then conducted a home visit to accurately document the client’s medication regimen and assess any barriers to care. A standard medication history form and an appendix consisting of 10 questions (7 relating to number and types of medication discrepancies) were developed and utilized during the home visits. Data were collected over 3 semesters (Fall 2018, Spring 2019 and Fall 2019). Results: 60 students were enrolled in the elective course over the study period and completed a total of 66 home visits. 171 medication related discrepancies were reported. The types of discrepancies documented were: 30% errors of omission, 30% errors of commission, 17% discontinued drug prescribed at discharge, 14% client taking medication differently than prescribed (including due to cost or side effects), 5% polypharmacy and 4% duplicate therapy. Conclusions: Our data suggest that this interprofessional collaboration in a community-based home setting is paramount to safe care transitions, and can impact patient care through effective medication reconciliation by student pharmacists.

Student Perception of Ability to Perform Pharmacokinetic Consults: An Evaluation of PKPD Course Restructuring

Morgen Jaeger, University of South Florida, Katlynd Sunjic, University of South Florida, Emily I Peabody.

Objective: To determine what effect changes to the clinical pharmacokinetics pharmacodynamics (cPKPD) course structure at University of South Florida Taneja College of Pharmacy (USF TCOP) had on students’ perceived ability to perform a pharmacokinetic consult. Methods: Course reformatting occurred between the 2016-2017 and 2017-2018 academic year. Assignments were replaced with case-based clinical consults to better represent real world pharmacy practice. Additionally, the course objectives were aligned with five of the ASHP Responsibilities of a Pharmacist’s Role in Clinical Pharmacokinetic Monitoring. In order to assess the novel course structure, a Qualtrics survey was distributed to all students that were enrolled in and completed the cPKPD course during their second year at USF TCOP in spring 2017 or 2018. The survey utilized a Likert scale to measure comfort within each of the five selected ASHP responsibilities in addition to overall comfort with completing a PKPD consult. Responses were collected prior to APPE rotations and averages were used to compare cohorts. We hypothesized that student comfort would improve as a result of the course change. Results: Total enrollment during the spring 2017 and 2018 offerings was 190 students. The response rate from the spring 2017 and 2018 cohorts were 32.6% and 5.1%, respectively. There was an average 3.32% increase in perceived comfort making recommendations based on drug PKPD. Though each responsibility had an increase in average comfort, perceived comfort in communicating patient-specific drug-therapy information had the highest percentage change (5.9%). Conclusions: Despite the low 2018 cohort response rate, implementing case-based consults that reflect actual scenarios encountered by clinical pharmacists improves students’ perceived ability to perform pharmacokinetic consults.
Student Perception of Academic Advising in a School of Pharmacy

Caroline Sierra, Loma Linda University, Jessa Koch, Loma Linda University, Jody Gonzalez, Loma Linda University, Khaled Bahjri, Loma Linda University.

Objective: Academic advising is an important component of pharmacy education, but minimal literature assesses the ideal means of providing these services. The objective of this study is to describe student perception of advising within a school of pharmacy. Methods: A 27-question survey was developed utilizing Qualtrics and sent via email to all students at Loma Linda University School of Pharmacy. No incentives were provided to students for participation. Baseline descriptive data regarding frequency and format of meeting with the assigned advisor was collected, in addition to students’ responses to and opinions of meetings with their advisors. Results: Of the 282 students who were sent the survey, 90 responded (31.9%). Most met with their faculty advisors twice yearly (n=36 46%), though others met three or more times annually (n=15, 17%). The majority of students preferred to meet with their faculty advisor in a group with other advisees as compared to one-on-one (59 vs. 29, 67%). Most students found the advisor/advisee relationship beneficial (n=77, 85%) and to be a valuable use of time (n=72, 81%). Students who met one-on-one with their advisor more commonly stated that their advisor helped them identify personal strengths and develop a plan to navigate pharmacy school stressors, though this difference was not statistically significant (p=0.389). Students were also asked to select the top three characteristics of an effective faculty advisor from a list of options. The most commonly selected characteristics were approachable (74%), knowledgeable (51%), and authentic (37%). Conclusions: There is no statistically significant difference in student perception of the quality or value of advisor/advisee meetings between students who meet in a group or one-on-one with their advisors.

Student Perceptions of the Use of Adaptive Learning Technology in a Pharmacists’ Patient Care Process Course

Kristen Pate, The University of Mississippi, Meagen M. Rosenthal, The University of Mississippi, Jennifer M. Toth.

Objective: To evaluate student perceptions of the use of Adaptive Learning Technology (ALT) software in a first professional year (P1) required Pharmacists’ Patient Care Process (PPCP) course series. Methods: AACP SoTL grant funding was used to support the implementation and use of adaptive learning technology (ALT) software during the spring semester of a PPCP course series; traditional teaching methods were used in the fall. Focus groups with students were conducted towards the end of the spring semester to collect student perceptions of the use of ALT for course delivery. Focus group participation was voluntary; focus group sessions were recorded, transcribed using electronic software, and then analyzed by the research team using qualitative content analysis. Results: A total of four focus groups were conducted with between four and five students in each group, for a total of 17 students. There were four themes identified from the qualitative content analysis. The themes were: student learning preferences, comparison of teaching methods across semesters, value, and technology. Overall, the focus group findings suggested that students preferred traditional in-class learning compared to using ALT for course delivery. Conclusions: ACPE “Standards 2016” recommend a curriculum “delivered via teaching/learning methods that: promote student responsibility for self-directed learning” (SDL), but research is needed to determine the best teaching methods to achieve this. The use of ALT is one technological innovation that could be used to support SDL and also contribute to personalized learning; however more research is needed to determine the most effective approach to align learning outcomes with student success and teaching methods.

Studying with a Chatbot: Assessment of Student Perceptions and Performance

Jenana H. Maker, University of the Pacific.

Objective: Objective of the study was to assess whether practice quizzes administered via a chatbot are engaging to student learners and improve performance on a summative exam. Methods: Study was conducted among 207 Doctor of Pharmacy students enrolled in renal therapeutics class. Three optional multiple-choice practice quizzes were made available via chatbot using Facebook Messenger. A survey was administered to capture student perceptions on the usefulness and engagement with chatbot practice quizzes. In order to assess whether there was any effect on outcomes, student performance on a summative exam was analyzed and compared between chatbot users and non-users. The analysis was conducted in Excel using a two-sample t-test with 95% confidence interval. IRB approval was obtained. Results: Analysis showed that 119 (57%) students used the chatbot at least once (range 1-32 times). Student usage was highest right after the instructor announcement of the practice quiz and right before the summative exam. Student perceptions survey indicated that 87.7% of students (strongly) agreed that the chatbot format was engaging, 84.7% that it was convenient, and 86.2% that it improved their learning. Performance data on summative exam showed that chatbot users performed slightly better on summative exam than non-users (17.4 [87%] vs. 16.75 [83%], p=0.03). Conclusions: Most students who used the chatbot found it engaging, convenient, and felt that it
helped them learn. Students who used chatbot performed slightly better on summative exam than students who did not. While further study is needed, chatbot-led self-testing format may be beneficial in enhancing student engagement and learning.

**Substance Abuse Training and Pharmacy Student Knowledge and Perceptions in Providing Substance Abuse Counseling**

Nataliya Scheinberg, Shenandoah University, Rebecca Andersen, Shenandoah University, Sean Kim, Shenandoah University, Michelle Gruver.

**Objective:** Because of the opioid crisis, it is essential for healthcare providers, including pharmacists, to identify patients at risk for substance abuse and intervene when necessary. Naloxone and SBIRT (Screening, Brief Intervention, Referral to Treatment) training, were incorporated into the PharmD curriculum to help accomplish this goal. This study evaluated the impact of substance abuse training (SAT) on pharmacy students’ knowledge and perceptions in their ability to provide substance abuse counseling. **Methods:** After an introductory SBIRT lecture, third year pharmacy students were surveyed pre-post SAT to assess their knowledge and comfort level regarding SBIRT and naloxone patient counseling and treatment. SAT involved SBIRT and naloxone training lectures, three active-learning sessions, and an objective structured clinical examination. Participants ranked their level of comfort in performing individual components of SBIRT and naloxone counseling and treatment on a 5-point Likert-scale: very uncomfortable, uncomfortable, neither comfortable/uncomfortable, comfortable, very comfortable. Unpaired and paired t-tests were conducted for pre-post survey knowledge and perceptions comparisons, respectively. Statistical significance was determined at \( p<0.05 \).

**Results:** Fifty-eight students (of 62) completed the pre-post surveys. Post SAT, student knowledge scores improved by 29.6% (\( P<0.05 \)). Self-perceptions of ability in performing naloxone and SBIRT counseling improved significantly (\( P<0.05 \)) in every category except for setting up follow-up for opioid misuse or abuse where a trend towards improvement was noted (\( P=0.085 \)). **Conclusions:** After SAT, student knowledge and self-perceived level of comfort in providing SBIRT and naloxone counseling and treatment improved significantly in most categories. Study results signal that SAT is useful in pharmacy curricula and may prepare students to support patients at increased risk for substance abuse.

**Systematic Assessment of PharmD Student Wellness Through a Formalized Student-Faculty Engagement Program**

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**Objective:** To assess student wellness through a formalized student-faculty engagement program for a large Doctor of Pharmacy cohort. **Methods:** Faculty members were randomly assigned four or five students in their first (P1), second (P2), and third (P3) professional years (12-15 students total) as part of the “One-to-One Student-Faculty Engagement Program.” Students were required to schedule at least one meeting with their assigned faculty member during the 2018-2019 academic year. Five core areas of the students’ personal and professional development were discussed during the meeting: wellness, career goals, academic progress, co-curricular activities, and professionalism. The wellness discussion focused on the student’s self-assessment of stress level (none, mild, moderate, severe) and ability to manage stress. Faculty documented student responses on an online data collection form. **Results:** All school of pharmacy faculty (n = 73) and 82% of P1, P2, and P3 students (n = 706/862) participated in the program. With respect to stress level, 5% of students reported no stress, 38% of students reported mild stress, 48% of students reported moderate stress, and 9% of students reported severe stress. With respect to managing stress, 83% of students believed they were managing their stress well, and 17% of students believed they were not. Students in the P2 year reported higher levels of stress (66% at the moderate or severe level) compared to their peers in the P1 and P3 years (54% at the moderate or severe level).

**Conclusions:** A formalized student-faculty engagement program provides an avenue for the systematic assessment of PharmD student wellness during a yearly meeting. This approach helps faculty proactively identify at-risk students (ie, those reporting poorly managed moderate/severe stress) who may benefit from counseling services or other support.

**Teaching Clinical Note Writing? Practice Leads to Better Transfer**

Karl Kodweis, Liza Schimmelpfing, Yanying Yan, Adam M. Persky, University of North Carolina at Chapel Hill.

**Objective:** The objective of this study is to explore the different effects between worked examples and practice problems in clinical note writing to evaluate which of these is the most effective instructional method for transferring skills. **Methods:** The study was a parallel design, with the conditions: instructional activity (worked example vs practice) and problem variability (low vs high). There were 3 phases. First, the learning phase required students to study a worked example for a patient
with hypertension. Second, half the students received another worked example, or a practice problem and these cases were either hypertension (low variability) or diabetes (high variability). Last, the final assessment stage occurred 3 days and asked students to generate 2 SOAP notes for 2 different disease conditions – hypertension (near transfer) or C. diff infection (far transfer). The primary outcome was performance of the clinical note assessment based on disease state under conditions of worked example or practice. The p-value was set at p < 0.05. We used a 2x2 ANOVA with Bonferroni adjustment. Results: Participants (n = 79) were included from the first-year class. The practice cohort showed a statistically significant benefit in both the near transfer task (68% vs 76%, p<0.001) and far transfer task (61% vs 69%, p<0.001). There was no interaction between condition (worked examples vs practice) and learning through the variability in clinical cases. Conclusions: Conclusion: Improvements in the overall scores of clinical notes favor the use of practice approach over worked examples. Surprisingly, having students practice on various disease states did not offer additional benefit compared to practice on a single disease state.

Techs as Teachers: Utilizing Intra-Professional Team Members as Co-Instructors in a Sterile Compounding Skills Lab
Alexandra M. Herman, The University of New Mexico, Fariba Nikookar Dashtmiani, University of New Mexico Hospital, Sabrina Bailey, University of New Mexico Hospital, Suzzette Sturtevant, University of New Mexico Hospital.
Objective: The objective of this study was to assess if utilizing pharmacy technicians as co-instructors in the sterile compounding block of a pharmacy skills lab changed student perceptions of the technician’s role and their trust in technicians to perform sterile compounding tasks.
Methods: Two pharmacy technicians were recruited from the University of New Mexico (UNM) Hospital and trained to assist with instruction in the Fall 2019 4-week sterile compounding block of the P2 pharmacy skills lab at UNM College of Pharmacy. Students completed a pre- and post-survey of 14 Likert scale questions (1 = strongly disagree and 5 = strongly agree) about their knowledge of pharmacy technician training and roles and their trust in pharmacy technicians to perform various tasks. Questions included “Pharmacy technicians are an essential member of the pharmacy team” and “I trust a pharmacy technician to perform sterile compounding calculations.” Paired t-tests were used to compare pre- and post-survey responses. Results: Of 59 students enrolled in the course, 55 (93.2%) completed the pre- and post-surveys. Responses to 12 of 14 questions demonstrated a statistically significant increase after the activity (p<0.05), indicating overall improved perceptions of the importance of pharmacy technicians and trust in the sterile compounding abilities of technicians. Conclusions: Pharmacy technicians and pharmacists work together every day, yet many colleges of pharmacy do not include pharmacy technicians as part of skills lab instruction. Our overarching goal was to improve student perceptions of technician roles and abilities prior to inpatient experiential rotations. Utilizing technicians as co-instructors in lab increased student awareness and appreciation of the importance of the technician’s role in sterile compounding. Additional opportunities may exist to further utilize technicians as co-instructors in skills labs.

The Big 8: Examining Patient Diversity in Cases Utilized in a Therapeutics Course Series
Jesse W Upton, Lynn Kassel, Drake University, Anisa Hansen, Drake University, Jared Butler, Drake University.
Objective: Patient-centered care has become the mainstay of treatment healthcare. Social identities have begun to strongly impact patient care. Early exposure to “The Big 8” identities (ie, race, ethnicity, sexual orientation, gender identity, ability, spirituality, nationality, and socioeconomic status) can increase awareness and prepare the student to provide more individualized care. The goal of this study is to identify and quantify the presence of “The Big 8” in cases presented student pharmacists in a course series. Methods: A total of 106 cases were analyzed to date. The primary objective was to quantify the inclusion of each social identity. Secondary objectives included if the presence of The Big 8 in the case added value or was needed to answer specific questions. We reviewed all “The Big 8” social identities in this study. IRB approval was not required. Cases were reviewed by two independent researchers. A third reviewer was utilized to resolve discrepancies. Results: We found a lack of inclusion in all 8 social identities evaluated, highlighting a large area for improvement. Race was most often stated (n=15, 14.1%), but its included prevalence in cases did not match the population. Conclusions: Early exposure to The Big 8, via classroom cases, is critical to provide more advanced care to patients. This study found “The Big 8” were rarely included in cases presented to students in a Therapeutics course series. Increasing inclusion of these identities will require faculty training, creation of a guide to help faculty integrate these themes more readily into classroom cases, and studying student comfort with each identity and faculty awareness.

The Development of a Pharmacy-Based Travel Health Services Elective Course
Bradley J. Newell, The University of Kansas, Brittany L. Melton, The University of Kansas, Crystal Burkhardt, The
University of Kansas, Robert L. Emerson, The University of Kansas.  

Objective: To develop a new one credit hour patient-centered, pharmacy-based travel health services (PBTHS) elective course. Scientific literature examining student knowledge and perceptions in this area are extremely limited and are focused solely in the practice area constituting a significant gap between curricula and practice. Methods: Students within the second and third professional years with successful completion of the APhA Immunization Certificate were eligible for enrollment within the elective course. Students within this elective were exposed to real-world concepts learned in the classroom through multiple teaching methods. Instruction was provided by first year pharmacy residents supervised by APhA Pharmacy-Based Travel Health certified faculty. Teaching methods included standard lectures, interactive discussions, treasure hunt activity, white board knowledge races, and case presentations based on predetermined scenarios. Assessment of student knowledge was completed through two exams and a formal case presentation completed by a group of three students. This study was approved by the IRB of the University of Kansas. Results: Currently, PBTHS are limited within the healthcare system and the Doctor of Pharmacy curriculum. At the completion of the elective course, students identified the importance and need for PBTHS and were able to implement the knowledge they obtained in a simulated community-based pharmacy practice setting case presentation. All students passed the elective and earned A’s. The course was evaluated by the school of pharmacy curriculum committee and identified to be a valuable addition to the current elective offerings. Conclusions: A PBTHS elective course utilizing multiple teaching methods increases pharmacy student’s knowledge and perceived importance for the services within the community-based pharmacy setting.

The Role of PhORCAS Database Functions vs. Traditional Curriculum Vitae in the Pharmacy Residency Application Cycle

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Objective: The Pharmacy Online Residency Centralized Application Service (PhORCAS) was introduced in 2012 as a means to simplify the pharmacy residency application process for both residency programs and candidates. Among its many features exists the ability for a candidate to highlight information normally found in a curriculum vitae (CV). This information is then made available to residency programs via a searchable database. Currently, no data exist to describe the role of these PhORCAS functions in the screening, interviewing, and ranking steps of the application cycle, leaving some to question their importance. The objective of this analysis is to describe the perceptions of residency program directors (RPD’s) on PhORCAS database functions vs. traditional CV’s in the residency application cycle. Methods: A survey was designed within Qualtrics® to assess RPD perceptions of CV and PhORCAS utilization in the pharmacy residency application cycle. This survey was distributed regionally among a small group of residency program directors for validation and subsequently distributed nationally to all identified RPD’s of ASHP-accredited pharmacy residency programs. Results: In total, there were 300 responses from a surveyed pool of 2318 RPD’s (12.9% response rate). The majority of RPD’s felt that CV’s were more useful than PhORCAS search functions for screening, interviewing, and ranking residency candidates (52.9%, n=136; 59.14%, n=152; 56.4%, n=145). Additionally, the majority of RPD’s indicated that they do not use PhORCAS search functions when screening or ranking residency candidates (61.1%, n=157; 77.4%, n=199). Conclusions: Though still in a relative state of infancy, PhORCAS database functions remain less utilized than CV’s in all steps of the residency candidates among the majority of survey respondents. This underscores the importance that pharmacy educators should continue to place on CV’s.

The Use of Simulation-Based Activity to Assess Pharmacy Student’s Practice Readiness in Cardiac Arrest Management

Cynthia Lee, Howard University, Dhakrit Run-kitwattanakul, Howard University.

Objective: To assess the impact of simulation activity on student’s practice readiness, measured by clinical knowledge and confidence level, in cardiac arrest management Methods: A cross-sectional analysis was conducted using data collected from pre- and post-quizzes to assess clinical knowledge and pre- and post-surveys to assess confidence. The quizzes consisted multiple choice, true or false, and fill in the blank questions to assess clinical knowledge. The surveys collected information on age, gender, BLS and ACLS certification status, previous live code participation, and pharmacy and health care-related experiences. In addition, they consisted 10 statements requiring 5-point Likert scale response to address confidence level in being an active member of cardiac arrest management team, familiarity with roles and responsibilities, knowledge of ACLS and post-cardiac arrest care protocols, identification of rhythms and potential causes, performing high-quality CPR, and selecting and
preparing appropriate medications. Paired t-test was used to compare the scores between pre- and post-simulation assessments. **Results:** Thirty-four students completed the simulation and pre- and post-quizzes. Thirty-two students (94.1%) completed the post-survey. Mean score between the overall pre- and post-quiz scores were not significantly different (81.4 ± 16.2% vs. 84.5 ± 10.6%; p > 0.05). Confidence level on most statements related to cardiac arrest management improved post-simulation compared to pre-simulation (p < 0.05), except for confidence level in ACLS protocol knowledge (3.88 ± 0.94 vs. 4.04 ± 0.94; p > 0.05), and performing high-quality CPR (3.94 ± 0.98 vs. 4.30 ± 0.99; p > 0.05). **Conclusions:** The results suggest the simulation activity did not affect student clinical knowledge. However, it was shown improves student confidence level in their ability to manage cardiac arrest. Incorporating simulation activity in pharmacy curriculum may enhance practice readiness in pharmacy students.

**Understanding Patients’ Out-of-Pocket Cost for Newer Guideline Recommended Diabetes Medications Under Medicare Part D**

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**Objective:** One in five patients with diabetes mellitus reports nonadherence to medications due to cost, and pharmacy students need to be aware of patients’ cost-sharing for newer guideline-recommended diabetes medications. We examined patients’ out-of-pocket cost for non-insulin antihyperglycemic drugs under Medicare Part D, which provides drug coverage for over 45 million beneficiaries.

**Methods:** Using 2019 Medicare Formulary and Pricing Files for 3,323 Part D plans nationwide, we examined price and cost-sharing for guideline recommended first-line (metformin) and novel second-line (GLP-1 agonists, SGLT2 inhibitors, DPP-4 inhibitors) agents compared with previously recommended generic therapies (sulfonylureas, TZDs). Projected annual out-of-pocket costs were calculated for metformin + lisinopril + atorvastatin regimens plus each second-line class under a standard 2019 Part D benefit. An ACE inhibitor and statin are commonly recommended for patients with diabetes and cost $5 or less per month.

**Results:** In 2019, GLP-1a, SGLT2i, and DPP-4i had monthly list prices of $434-$935 compared with $3-$11 for metformin, sulfonylureas, and TZDs. Annual cost for GLP-1a, SGLT2i, and DPP-4i ranged from $5,202-$11,225, while metformin, sulfonylureas, and TZD cost $31-$136. Patients on guideline-recommended regimens of metformin + lisinopril + statin and a newer agent (GLP-1a, SGLT2i or DPP-4i) may be required to pay $1,231-$2,026 in annual out-of-pocket costs, compared with $298-$355 for regimens with previously recommended second-line drugs (sulfonylurea, TZDs).

**Conclusions:** Newer brand-name guideline-recommended diabetes medications (GLP-1a, DPP-4i, and SGLT2i) cost 20-100x the price of generic metformin, sulfonylureas, and TZDs. Pharmacy students should be aware that patients prescribed these drugs may face payments of $1,000 - $2,000 out-of-pocket annually or may choose non-adherence to their prescriptions. Including such findings and analyses in pharmacy curriculums would greatly improve students’ understanding of Medicare Part D and how out-of-pocket costs are a barrier to medication adherence.

**Use of a Repeated Problem Solving Patient Case Activity to Identify Students Lacking Pre-APPE Readiness**


**Objective:** To evaluate whether there is a correlation between student performance on patient profile review activities (Rx Reviews) and performance on Advanced Pharmacy Practice Experiences (APPEs) in the acute care and ambulatory care settings.

**Methods:** Rx Review scores in P2 and P3 years were compared to performance on acute care I, II, and ambulatory care APPEs for students in the graduating class of 2019. Descriptive statistics were used to summarize student scores on Rx Reviews. Bivariate logistic regression was used to assess whether Rx Review scores were associated with performance outcomes on selected APPEs. Students were also surveyed to rate how helpful the Rx Review activities were in preparing them for APPEs. Descriptive statistics were used to analyze student responses to the multiple-choice survey questions. Qualitative responses to the open-ended question were assessed for common themes.

**Results:** A total of 122 students participated in the study. A significant association was found between students’ Rx Review scores and performance in acute care and ambulatory care APPEs. Students who, on average, performed in the bottom half of the class on Rx Reviews were nearly 10-14 times more likely to perform poorly on their acute care II and ambulatory care rotations. More than
93% of students identified Rx Reviews as at least somewhat helpful in preparing them for acute care I and II rotations. **Conclusions:** This study showed predictive value in a timed patient case activity for future APPE performance, particularly in ambulatory care and acute care rotations.

**Use of Electronic Learning Management Platform to Facilitate Inter-Institutional Collaboration: West Coast Meets Eastern Shore**

Ettie Rosenberg, West Coast University, Hoai-An Truong, University of Maryland Eastern Shore, Shih-Ying (Audrey) H Hsu, Reza Taheri, Chapman University, Lynn A. Lang, University of Maryland Eastern Shore, Josephine M Belen, West Coast University School of Pharmacy, Susanna Kim, West Coast University School of Pharmacy.

**Objective:** To evaluate the feasibility of using an electronic learning management platform to facilitate student collaboration across two geographically remote Doctor of Pharmacy programs where students from the two institutions shared research, arguments and trial strategy in parallel mock trial projects. **Methods:**Investigators developed an anonymous 17-item survey instrument to evaluate students’ perceptions of Blackboard Collaborate®, an electronic learning management platform. At the conclusion of their collaboration in the parallel mock trial projects, student-participants completed the survey tool. Survey items were grouped into four categories based on a Technology Acceptance Model including: Usefulness, Ease of Use, Attitude, and Behavioral Intention. Responses were recorded using a scale of 1-7; with 1 as “strongly disagree” and 7 as “strongly agree.” Descriptive analyses were performed for each item and scale. This study received Institutional Review Board approval from each institution. **Results:** Sixty-nine WCU students and 31 UMES students completed the survey (response rate = 100%). All but one of the 17 items had a mean score above 5; though even this single outlier was close to 5. Results from the Perceived Usefulness Scale (mean 5.07, SD 1.77), Perceived Ease of Use Scale (mean 5.50, SD 1.62), Attitude Toward Using Scale (mean 5.12 SD 1.78), and Behavioral Intention Scale (mean 4.95, SD 1.88) were all leaned toward acceptance/agreement as to the use of Blackboard Collaborate®. **Conclusions:** This study confirms that Blackboard Collaborate® can be instrumental in facilitating students in different locations to work together. Online platforms have the potential to bridge geographical gaps for inter-institutional collaboration.

**Using a Graphic Organizer Template for Active Learning During a Lecture**

Adam C. Welch, East Tennessee State University, Michele Williams, East Tennessee State University.

**Objective:** A graphic organizer is a form of active learning that includes a learner using drawings and infographics to connect concepts. The aim of this study was to describe a graphic organizer tool that can be used as an interactive, step-by-step template to incorporate active learning into a lecture. Student perceived engagement, understanding, and interest in the material were primary endpoints in the pilot of this tool. **Methods:** A graphic organizer template was developed and piloted in a P1 OTC lecture on allergic contact dermatitis. It provided steps for selecting a topic, writing objectives using Bloom’s Taxonomy, introducing the activity, delivering the activity, checking for understanding, debriefing, determining assessment questions, and notes for future lectures. During the classroom activity students formed small groups and drew images that graphically represented treatment options for mild, moderate, and severe allergic contact dermatitis. Students were surveyed immediately after class using a six-point Likert scale with no neutral option on their perceived understanding of the material, and interest and engagement in the activity. A paired samples t-test was used to compare student perceptions. **Results:** Fifty-nine students attended the lecture with 53 (89.8%) completing and consenting to the survey. Overall median responses for the 10 questions were 5 (agree). Mean (SD) responses revealed that students had a higher perception of engagement (5.15 [0.57]) than understanding of the material (4.97 [0.81]), t=-2.33, p=.024. The interest questions had an overall mean (SD) of 5.03 (0.74). **Conclusions:** The distinction between engagement and understanding was statistically significant but likely of low utility. Assessing student performance on exam questions could be one way to identify if understanding of the course material changed with this activity.

**Using an Observer-Focused Rubric During Peer Observation of Patient Simulations in a Pharmacy Skills Lab**

Thomas M. Matta, Northeastern University, Todd A. Brown, Northeastern University, Jennifer Kirwin, Northeastern University, Danielle M. Miller, Northeastern University.

**Objective:** The primary objective of this project was to assess pharmacy students’ perspectives on the use of peer observation and debriefing of patient simulations to better prepare students for ambulatory care patient interviews. The secondary objective was to investigate the impact of an observer rubric completed during observation of a patient simulation. **Methods:** Our Comprehensive Disease Management Skills Lab was modified to incorporate students as peer observers of patient simulations. Students were asked to observe a patient interview simulation, complete an observer rubric, and then attended a debrief.
with the observed student and a trained instructor. Students completed a survey to assess their perspective on the benefit of simulation observations and the focused rubric. **Results**: In total, 89.2% of students (n = 99) completed the survey. The majority of respondents (>92%) enjoyed being able to observe a patient simulation and felt it was beneficial to their learning and ability to conduct ambulatory care focused patient interviews. The majority of respondents (>94%) reported the rubric as effective in helping contribute to the debriefing session and recommended future classes continue using the rubric. **Conclusions**: Study results show that pharmacy students support the use of peer observation and perceive it as beneficial to their learning. Utilization of a focused rubric allows the student to objectively assess their peers and equips them to engage in meaningful debriefing.

**Using a Virtual Role-Playing Game to Teach Core Concepts of Diabetes Therapeutics**
Vicky Belousova, D’Youville College, Michael S. MacEvoy, D’Youville College, Nico Conorozzo, Jeffery Stewart, Mario Beccari, D’Youville, Jeremiah Grabowski, D’Youville College, Amany K Hassan, D’Youville College.

**Objective**: To describe the design and implementation of virtual role-playing game to teach therapeutics and evaluate the change in knowledge and perceived benefit by student pharmacists. **Methods**: First-year students worked in teams to complete quests in Classcraft®, an engagement management system. Quests focused on the management of diabetic patients based on clinical guidelines and included pharmacy calculations, use of drug-information databases, patient education, and identification and resolution of drug-related problems. Successful quest completion resulted in experience points, gold, and medication cards that were used to level up characters and purchase upgrades for the final quest. Surveys were administered before and after the game to measure changes in knowledge and perceptions. Data was analyzed using descriptive statistics and McNemar or paired t-test. **Results**: A total of 64 students completed the survey (98.5%) but only 48 students had complete pre- and post- survey data (75%). While 6 students (9.4%) were familiar with gamification in education, 55 (85.9%) indicated they would be interested in them. After the game, 88% agreed it was an effective way to learn about diabetes and that the subsequent discussions cemented their knowledge and 77% enjoyed the game compared to standard lecture. The perceived comfort navigating the guidelines also improved from 59% to 85% (p < 0.0001). There was a statistically significant increase in performance on knowledge questions relating to drug-induced diabetes (p < 0.0001), A1c levels (p = 0.018), fasting glucose levels (p = 0.008), and screening for diabetes (p < 0.0001). Main challenges included a learning curve, build-time, and identifying appropriate assessment tools. **Conclusions**: Participation in the game increased short-term knowledge retention. A video game is currently in development to test improvement in long-term retention and include a wider range of topics.

**Using the Continuing Professional Development Model to Implement a NAPLEX Study Plan During APPEs**
Mary K. Stamatakis, West Virginia University, Gretchen M. Garofoli, West Virginia University, Mark P. Garofoli, West Virginia University.

**Objective**: To design and implement a self-directed continuing professional development (CPD) study plan for NAPLEX examination preparation in the fourth year of the PharmD curriculum. **Methods**: Early in the APPE curriculum, students identified areas of weakness based on their performance in previous didactic and early experiential courses, as well as by their scores on the PCOA and a practice NAPLEX examination. Students created a study plan and timeline, identifying therapeutic areas to be reviewed during the remainder of the APPE year. All students were required to select a minimum of three chapters to review during each APPE (standard plan), but could complete a greater number of chapters (aggressive plan). Using chapters from the RxPrep® Study Guide, students studied the chapters outside of rotation time and completed the corresponding online quiz. Questionnaires and pre-NAPLEX exams were completed at the beginning and end of the project. University IRB approval was obtained. **Results**: Of the 72 students in the fourth-year class, 26 selected an aggressive plan and 46 selected the standard plan. Therapeutic areas most frequently included in their study plans were infectious diseases, diabetes mellitus, anticoagulation, depression, and chronic heart failure. Twenty-one students altered their study plan due to identification of new learning needs. Agreement with whether the student plan was helpful in preparing for the exam increased over the study period (35% at midpoint, 57% at graduation, and 66% post-graduation/post-NAPLEX). Pre-NAPLEX exam scores improved by 31% during the APPE year. **Conclusions**: Agreement that the CPD plan was helpful in preparing for the exam increased after completion of the NAPLEX exam. The greatest barrier identified was having time to complete the chapters during rigorous APPEs.

**Using Video Conferencing Technology for a Mock-Trial Competition Across Geographically Separated Pharmacy Programs**
Ettie Rosenberg, West Coast University, Hoai-An Truong, University of Maryland Eastern Shore, Shih-Ying (Audrey) H
Hsu, Reza Taheri, Chapman University, Kyle Langan, West Coast University School of Pharmacy, Emmanuel Olivares, West Coast University School of Pharmacy.

**Objective:** To evaluate feasibility of video-conferencing technology to facilitate a head-to-head mock trial competition between student-pharmacists at two pharmacy programs in different locations. **Methods:** Eighteen students at one school and 18 at another participated in a mock-trial competition that was live streamed and recorded via video-conferencing technology. Following competition, students responded to a 17-item anonymous survey about their experience debating with students in another program at a different location. Based on Technology Acceptance Model, survey items were grouped into four categories: Usefulness, Ease of Use, Attitude, and Behavior Intention. Responses were recorded using a 5-point Likert scale with 1 being strongly disagree and 5 being strongly agree. This study received Institutional Review Board approval from both institutions, and descriptive analyses were performed. **Results:** Thirty-three students completed the survey (response rate = 91.7%). The results indicated positive perception toward the use of video-conferencing technology, with an average rating above 3.5 for all items. Results regarding the 4 categories showed that “usefulness” (mean 4.28, SD 1.06), “attitude” (mean 4.19, SD 1.10), and “behavior intention” (mean 4.18, SD 1.09) are perceived more positively than “ease of use” (mean 3.85, SD 0.89). **Conclusions:** This study suggests video-conferencing technology was well received and effective in engaging students from two programs at different locations; these results may have a broader implication for using technology to facilitate similar cross-institutional student engagement.

**Utilization and Enhancement of Programs and Resources Offered by the Pharmacy Practice Section: Member Insights**

Rashi C. Waghel, Wingate University, Jennifer A. Wilson, Wingate University, Jane E. Krause, Purdue University, Megan Z Roberts, Samford University, Casey J Bernier, Purdue University, Jessica Wallace, Lipscomb University.

**Objective:** To evaluate AACP Pharmacy Practice Section members’ current utilization of programs and resources and to identify potential opportunities for enhancement. **Methods:** Corresponding to a committee charge, an anonymous 8-item electronic questionnaire was emailed to all Section members immediately following the Annual meeting in July 2019. Multiple-choice and open-ended questions were included. Descriptive statistics were utilized for analysis of data. Open-ended responses were qualitatively analyzed to generate themes. **Results:** A total of 237 Section members responded including professors (23%), associate professors (32%), and assistant professors (39%). Approximately 50% of the respondents had been a member of the Pharmacy Practice Section for over five years. Regarding existing offerings, webinars were deemed most useful (65%), followed by discussion boards (48%), newsletters (31%), Section reports (14%), and meeting minutes (6%). The vast majority (90%) agreed or strongly agreed that sufficient programs and resources were currently offered. However, of note, 20% of participants had not utilized any of the current programs and resources offered. A total of 93 open-ended suggestions were received regarding topics for future initiatives. From these, three themes emerged: 1) faculty development, 2) practice innovation/advancement, and 3) engagement with AACP. Within the faculty development theme, four subthemes were identified: teaching/assessment, research/scholarship, mentoring, and workload management. Webinars were the most commonly requested content delivery method among the open-ended responses. **Conclusions:** The Section members provided thoughtful insights for enhancing programs and resources which could potentially be utilized by other committees and Sections of AACP. For continued growth, the implementation of a recurring process to obtain member insights should be explored.

**Utilization of an IPEC Core Competency Assessment Instrument Measuring Student Self-Efficacy Within a Pharmacotherapy Course**

Jackie M Zeeman, University of North Carolina at Chapel Hill, Philip T. Rodgers, University of North Carolina at Chapel Hill, Kimberly A. Sanders, University of North Carolina at Chapel Hill.

**Objective:** Interprofessional education (IPE) is an essential component to building effective interprofessional practices. Gaps remain in identifying effective measures to assess student learning and skill development in classroom-based IPE activities. The purpose of this study was to evaluate student self-efficacy on the IPE Collaborative (IPEC) core competencies before and after a classroom-based IPE activity within a pharmacotherapy course. **Methods:** Third-year pharmacy (n = 142), third-year dental (n = 80), and second-year dental hygiene (n = 36) students participated in a classroom-based IPE case collaboration activity designed by a multidisciplinary faculty team. Students completed a voluntary survey measuring their level of confidence in performing each IPEC core competency using a 6-point self-efficacy rating (1- Very unconfident, 2-Unconfident, 3-Somewhat unconfident, 4-Somewhat confident, 5-Confident, 6-Very confident) before and after the IPE activity. **Results:** Student-reported self-efficacy increased after the IPE activity...
on multiple IPEC competencies. Students reported being more “confident” or “very confident” in their ability to: use the full scope of knowledge, skill, and abilities of professionals from health and other fields to provide care that is safe, timely efficient, effective, and equitable (pre: 58%, post: 80%); communicate with team members to clarify each member’s responsibility in executing components of a treatment plan or public health intervention (pre: 60%, post: 78%); and choose effective communication tools and techniques, including information systems and communication technologies, to facilitate discussions and interactions that enhance team function (pre: 56%, post: 77%). Conclusions: The self-efficacy instrument measured increased student confidence in performing each IPEC core competency after participation in an IPE pharmacotherapy case collaboration involving pharmacy, dental, and dental hygiene students. These data suggest the instrument may be effective at measuring student self-efficacy on the IPEC core competencies in classroom-based IPE activities.

Utilizing a Progressive Case and Escape Game to Assess P2 Students Ability to Manage Hypertensive Crisis
Katelin Lisenby, Auburn University; M. Jeanna Sewell, Auburn University, Lauren Cimino.
Objective: To develop an engaging and effective escape game to assess students’ ability to differentiate and manage hypertensive crises. Methods: Hypertensive crisis content was delivered to P2 students followed immediately by an escape game assessment. The escape game was built utilizing Google Forms and incorporated a progressive patient case where groups of four to seven students responded to 26 assessment questions worth 30 points. Assessment questions involved physical and laboratory assessments and identifying precipitating factors with the ultimate goal to differentiate between hypertensive urgency and emergency and recommend appropriate management. Various activities were embedded such as word scrambles, puzzles, and identifying real-world images and resources. Students received feedback through Google Forms following submission. Groups were awarded for response time and accuracy. Formal assessment item statistics were also evaluated. Results: Twenty-eight groups completed the escape game within six to 14 minutes. The mean score was 25.86 points (86%) with a range of 23-29 points. Fourteen of the 26 questions were answered accurately by all groups, including identifying the scenario as hypertensive urgency and recommending reinitiation of two first-line antihypertensives. Seventy-nine percent of groups correctly identified non-adherence to a beta-blocker as a potential precipitating factor. The most frequently missed questions included recognizing all pertinent signs and symptoms and labs to assess for organ damage and patient counseling points. Student performance on correlating formal assessment questions was desirable, with an average difficulty level of 0.7, point biserial of 0.27, and discrimination index of 0.26. Informal student feedback on their confidence to distinguish hypertensive crisis cases was positive. Conclusions: The escape game was an effective assessment tool and supported students’ ability to evaluate and manage a hypertensive crisis scenario in a real-world setting.

Utilizing Novel Active Learning Techniques to Improve Student Readiness
Angharad Ratliff, Idaho State University, Catherine M Oliphant, Idaho State University, Renee F Robinson, Idaho State University.
Objective: Our infectious disease (ID) pharmacotherapy module is subjectively considered by students to be the most difficult and fast-paced module. In order to better prepare students to begin the course, we introduced active learning strategies including an escape room. Our aim is to assess how the students feel that these interventions helped to prepare them for the module and if there was any impact on overall course performance. Methods: A pre-post research design was used to assess student self-reported perceived change in preparedness to begin the ID module. Students completed a survey immediately following the escape room activity and at the completion of the module. Additionally, overall performance in the module was compared to the year prior to the intervention using a Mann-Whitney U test. Survey data was collected on a Likert scale and compared using a Mann-Whitney U test. Results: Overall performance in the course did not differ from year to year (p = 0.84). However, as compared to the pre-course assessment, more students felt that they were prepared to begin the course (p < 0.0005). Students reported that the course was structured appropriately and the majority of students (83%) felt that the activities provided to them helped improve their performance in the course. Conclusions: While the implementation of additional active learning strategies did not improve student’s overall performance, it did improve their perception of preparedness to begin the course. In future offerings of this course, we plan to continue to increase the active learning strategies employed and create intentionality in our testing strategy to quantify student performance on topics covered with active learning strategies.

Utilizing Web-Based Concept-Mapping Assignment to Promote Problem-Solving, Creative-Thinking, Communication and Collaboration in PharmD Curriculum
Minakshi Lahiri, Wayne State University, Linda A. Jaber, Wayne State University, Dana El Masri.
Objective: To assess the impact of web-based concept-mapping project on PharmD students’ problem-solving,
creative-thinking, communication, and collaborative-learning skills. **Methods:** Participants of this novel mixed-methods study were recruited from second-year PharmD students registered in Fall 2018 Pharmacotherapy course. Concept-map development, web-tools, and assignments were introduced during a class session. Online instructional-video and resources on concept-maps were delivered using Canvas. An additional optional session on concept-map project was also offered. The patient case-based project was designed with individual and group-work components. A rubric was developed for assessing concept-map projects and in-class peer-group presentation of concept-maps. Student perceptions of using concept-maps as a learning-tool were obtained by pre-and-post Qualtrics surveys. Statistical analysis of exam performance on relevant content for the Fall 2018 students relative to Fall 2017 students was performed using SPSS. **Results:** A total of 114 and 95 students participated in the pre- and post-surveys (response-rate 100% and 83.3% respectively). From post-survey, 42.1% responded favorably to incorporating this tool. Positive feedback was reported on concept-maps as a tool for improved knowledge-organization (50.5%), students were able to identify relationships between concepts (55.8%), to visualize a complete pharmacotherapeutic plan for the disease-state (49.4%), and to effectively collaborate with their peers (52.6%). Independent samples t-test indicated significant difference in performance on the exam content with Fall 2018 students performing better (86.1 +/- 5.1) over Fall 2017 students (84.0 +/- 7.1), p = 0.016. **Conclusions:** The Accreditation Council for Pharmacy Education in Standards 3 and 4 recommend pharmacy programs to promote student learning in problem-solving, communication, creative-thinking/innovation and collaboration. Concept-maps can be used as a novel teaching and learning strategy to promote and assess problem-solving, creative-thinking, collaboration and communication-skills in the PharmD didactic curriculum.

**Video Recording vs. Virtual Simulation Software: Comparing Methods of Practicing Self-Care Counseling**

Laura E. Knockel, The University of Iowa.

**Objective:** 1. To evaluate current and new methods of practicing self-care counseling in the curriculum. 2. To gather information about students’ preferred methods of practicing self-care counseling. **Methods:** The self-care curriculum at the University of Iowa College of Pharmacy includes practicing self-care counseling through video recording counseling sessions with a lab partner. Students are assessed thereafter during a simulated live counseling session with a fourth-year academic rotation student or faculty member. In the fall of 2019, MyDispense, a community pharmacy virtual simulation software, was added as a method of practicing self-care counseling. Second and third-year student pharmacists were surveyed via Qualtrics to gather feedback regarding MyDispense and its effectiveness in helping them practice self-care counseling. **Results:** Completion rate of the anonymous, voluntary survey was 33.7% amongst P2 students (n=32) and 41% amongst P3 students (n=46), for an overall response rate of 37.7%. Eighty-three percent (83%) of students felt MyDispense was easy to use and 72% felt it was a valuable tool to learn self-care counseling. MyDispense was identified as more helpful for learning self-care content than recorded counseling by 54% of respondents (marked strongly agree or agree), while 26% disagreed or strongly disagreed and the remaining 20% responded as neutral. Over half of respondents (60%) felt MyDispense should be kept in the self-care curriculum, while 35% were undecided. **Conclusions:** MyDispense was an effective addition to the self-care curriculum during the second and third year of pharmacy school and is a viable option for practicing self-care counseling.

**Viewpoints of Residency Program Directors Regarding the Development of Depressive Symptoms in Pharmacy Residents**

Vasudha Gupta, Roseman University of Health Sciences, Evan Williams, Roseman University of Health Sciences, Kaylee N Vitale, Elizabeth J. Unni, Touro College of Pharmacy-New York.

**Objective:** Several publications have highlighted residency-specific factors being associated with depressive symptoms in pharmacy residents, but no studies have investigated the viewpoint of residency program directors (RPDs) regarding this issue. The primary objectives of this study were to identify potential contributing factors, determine current resources available, and outline possible solutions to decrease the burden of depressive symptoms among pharmacy residents from the point of view of RPDs. **Methods:** RPDs were asked to participate in a 45-60 minutes semi-structured interview conducted via phone by the primary investigator, recorded, and transcribed using NVivo. Interviews were analyzed using NVivo qualitative data analysis software to identify emerging themes based on similarities between interviews. The investigators discussed findings and discrepancies to agree upon thematic interpretations of the transcripts. **Results:** Ten interviews were conducted between May 2019 and January 2020. The number of years RPDs had been in practice ranged from 2-15 years. General PGY1 programs comprised 60% of interviews, 20% for community practice, and 10% each for managed care and

825
ambulatory care. All RPDs indicated increased workload as a contributing factor to depressive symptoms in residents. The inability to accept and utilize constructive feedback and difficulty transitioning from student to resident were identified as contributing factors by 50% of the RPDs. Nine RPDs reported having employee assistance programs, stating the resource was underutilized, and identified the need for additional education regarding identification and triage, not necessarily management, to help residents. Conclusions: This study highlights consistency among RPDs regarding contributors of depressive symptoms in pharmacy residents, and emphasizes the need for additional RPD and preceptor training to more effectively identify symptoms to better help residents.

**Zoom-In on Student Learning-Experience: Using Longitudinal Student Focus-Groups for Evaluating a PharmD (P1 - P3) Didactic-Curriculum Renewal**

Minakshi Lahiri, Wayne State University, Justine S. Gortney, Wayne State University, Lynette R. Moser, Wayne State University, Candice L. Garwood, Wayne State University, Helen Berlie, Wayne State University.

Objective: To investigate learning experiences of students longitudinally, during the implementation of a renewed P1 – P3 didactic curriculum, with the purpose of improving the curriculum, encouraging teaching excellence and promoting student-success. Methods: Focus group methodology has wide acceptance for curriculum and program evaluation in health education settings. Non-directive moderator-style exploratory focus group (Stalmeijer, McNaughton & Van Mook, 2014) was used to assess student perspectives on the learning experiences with the renewed-curriculum after every semester of P1 and P3 years. Two to Three focus groups with 8-10 students (Total class-size – 102 students) in each group were recruited using purposive sampling after each semester. Pre-designed question prompts were used to match each semester specific curricular aspects. Focus groups were facilitated by non-faculty academic personnel to eliminate bias. Sessions were audio recorded; additional feedback from participants and facilitators notes were collected. All qualitative data were coded, analyzed and triangulated using Miles & Huberman’s data analysis model (1994). Results: Participants expressed satisfaction with several aspects of the renewed curriculum. Opportunities for improvement were identified with the renewed curriculum which included pharmacy calculations, group assignments, access and communication with some faculty, faculty advising, problem based learning courses and tracking of co-curricular activities. The findings were presented to the Curriculum Committee and resulted in recommendations for individual courses as well as curricular and co-curricular changes. Conclusions: Student focus group feedback can be useful qualitative data when evaluating curricular renewal efforts. This type of feedback offers a model for program improvement that is learner centered which can be used in combination with other assessment data to improve pharmacy programs.

**SOCIAL AND ADMINISTRATIVE SCIENCES**

**A Novel, Community Based Approach for Teaching Pharmacy Students About Social Determinants of Health.**

Nicole M. Sifontis, Temple University, Terriann Dember, Lisa M. Becker, Temple University.

Objective: This is a programmatic description of a serving learning project in a public health elective (PHE) course that engaged students to learn about and identify social determinants of health (SDoH), to better prepare them to provide quality healthcare. Methods: Temple Transitions of Care Program (TCPH/TOCP) partnered with the School of Pharmacy in this PHE course, offered to third professional year Doctor of Pharmacy students. A community health worker from the TCPH/TOCP program and assigned student pharmacist were responsible for conducting a home visit in the community, in part, to identify any SDoH that were barriers to care. Clients selected for these home visits met the high-risk criteria defined by TCPH/TOCP. In preparation for the home visits, students received a 2-hour lecture on population health and participated in a 1 hour in-class team-based activity in which they were assigned one of the five SDoH to report on based on literature from healthypeople2020.gov. Upon completion of the home visit, students were required to document the SDoH(s) that appeared to impact their client’s current health status and reflect on their experience. Results: 20 students were enrolled in the PHE course in the fall 2019 and completed a total of 20 home visits. Students reported the following as the most pertinent SDoH impacting their client after participating in the home visit: 26% (n=11) economic stability; 26% (n=11) neighborhood and built environment; 21% (n=9) health and healthcare; 17% education (n=7) and 10% (n=4) social and community. Conclusions: This program was effective at exposing students to real life scenarios involving SDoH that may impact medication adherence and patient outcomes. Students reflected positively on this experience and its impact on their learning.

**Assessing Personalized Learning Preference Using Meyers Briggs Type Indicator**

Rebecca Hoover, Idaho State University, Michael Biddle, Idaho State University, Glenda Carr, Idaho State University.
Objective: To determine whether perceived effectiveness of partnered or large group learning method of basic drug counseling differs between students characterized as extroverts or introverts using the Meyers Briggs Type Indicator (MBTI). Methods: Second year pharmacy students studied leadership and communication skills during a semester long lab that met for 2 hours each week for 16 weeks. Early in the semester students took the MBTI for insights into personality traits, social style, leadership skills. This two-hour long session was given by a MBTI-credentialed psychologist. Students at one campus were then randomized to receive either partnered counseling practice followed by full class demonstrations or self-study practice followed by partnered practice. Students were then asked to rate their confidence counseling patients and perceived effectiveness in delivery methods. Results: Students in the partner/large group self-rated as equally confident in their counseling skills but introverts within the group rated the experience as more successful than extroverts (3.7 versus 3.0, respectively on a 1 to 5 scale; p < .03). Alternatively, students in the self study/partner group rated themselves as more confident in their counseling skills with no difference between introverts and extroverts. Conclusions: Due to small sample size, this study’s results may be due to a type II error. However, this pilot student helps to identify the importance and role of personalized learning in pharmacy education. Allowing students to step outside their stereotypical preferred learning strategy may be beneficial for tasks requiring extensive practice.

Assessment of the Kiersma-Chen Empathy Scale-Revised and Patient Version (KCES-R, KCES-PV) With Simulated Patients
Michelle L. Blakely, University of Wyoming, Emily Wicker, Mary E. Kiersma, Accreditation Council for Pharmacy Education, Juanita A. Draime, Cedarville University, Benjamin D. Aronson, Ohio Northern University, Aleda M. Chen, Cedarville University.

Objective: With a continued need to evaluate the affective domain, measures are needed to accurately assess student skills when interacting with patients. The objectives of this study were to: (1) determine the validity evidence of the KCES-PV and KCES-R, (2) determine the convergent validity of the KCES-PV and KCES-R, and (3) explore student self-awareness of empathy toward patients.

Methods: P2 students at 2 pharmacy schools completed the KCES-R before and after observed structured clinical experiences (OSCEs). Simulated patients completed the KCES-PV after the OSCE to assess student empathy. The KCES-R and KCES-PV are 7-point, Likert-type instruments with 14 items across 2 sections (global healthcare professional empathy; personal/student empathy skills). The maximum section and total scores are 49 and 98, respectively. Psychometric tests were performed, and Wilcoxon Signed-Ranks Test was used to compare non-normally distributed pre/post data. Results: The KCES-PV (global=0.970, student=0.980) and KCES-R (global=0.923, personal=0.911) had high internal consistency. Student and patient global ratings of empathy in healthcare were correlated (Rho=0.66, p<.001), but ratings of student skill were not (Rho=0.02, p=.843). For the KCES-PV (n=93), median scores were: 43 (global), 34 (student), and 74 (total). For the KCES-R (n=94), median scores were: 45 (global-pre) and 48 (global-post, p=.001); 41 (personal-pre) and 42 (personal-post, p<.001); 84.5 (total-pre) and 86 (total-post, p<.001). Conclusions: Patients’ perceptions of students’ empathy were lower than the students’ self-perceptions of empathy. This demonstrates a need for student pharmacists to be more self-aware of how they are perceived and practice demonstrating empathy, as both students and patients recognize the importance of empathy in healthcare interactions.

Automated Analysis of Course Evaluation Comments: The Use of Sentiment Analysis to Characterize Classroom Teaching
Jacqueline McLaughlin, University of North Carolina at Chapel Hill, Carly Lupton-Smith, Johns Hopkins University, Robert Hubal, University of North Carolina at Chapel Hill, Erica Bell, Adam M. Persky, University of North Carolina at Chapel Hill.

Objective: The purpose of this study was to develop and test a digital tool that can automatically characterize student comments on course evaluations. Methods: Course evaluation comments were collected from 5 courses. A total of 293 comments were analyzed using an R-based sentiment analysis program. The program calculated a sentence score for each comment, indicating if the comment was positive or negative. Two reviewers independently coded 15% of the results as 1-‘program was correct’ and 0-‘program was incorrect’. Since consensus exceeded 90%, one reviewer independently coded the remaining comments. Results were used to identify terminology that could suggest potential issues with a course, since these terms could be added to the sentiment analysis program to automatically flag comments. Agreement between individuals is represented as frequency (%); average sentence scores are presented as mean ± standard deviation. Results: The level of agreement between reviewers was 93% (n=41/44 comments). The program correctly coded 95% of negative comments but only 33% of positive comments. Correctly coded positive terms had a sentence score of .64 ± .33 while missed positive terms
had a score of $0.25 \pm 0.21$. Correctly-coded negative terms had a sentence score of $-0.25 \pm 0.23$ while missed negative terms had a score of $-1.3 \pm 0.05$. Terms identified in the positive comments that actually could flag negative comments included confused, trouble, unclear, frustrated, and wish. **Conclusions:** In course evaluations, written qualitative comments can provide important context and depth about student experiences within a class but may be time-intensive to review. Sentiment analysis and similar automated language-based tools can enable educators and schools to efficiently identify and respond to potential issues. Further refinement is planned to improve accuracy and utility of the program.

**Community Pharmacy Owners’ Perceptions of Performance-Based Pharmacy Payment Models**


**Objective:** To collect community pharmacy owners’ experiences with, perceptions of, and responses to performance-based pharmacy payment models (PBPPMs).

**Methods:** Published literature and qualitative results from a related study evaluating facilitators and barriers to implementation of PBPPMs were used to develop the electronic survey for this study. The survey included questions on the types of measures and incentives used in PBPPMs, opinions of PBPPMs, changes to practice implemented because of PBPPMs, and respondent demographics. The survey was distributed between November 2019 and January 2020. Univariate statistics and thematic analysis were used to describe results. **Results:** There were 68 respondents. After excluding respondents who did not own a pharmacy or have any exposure to PBPPMs, 41 remained. The most common quality measures used for these models were Medicare Stars Rating measures followed by financial performance measures. Performance measures were reported across all payer types. Negative financial impact was reported by 90% of respondents and many implemented changes to improve their performance. From the open-ended responses, some respondents considered these models a “necessary evil” and many were highly critical of their design. **Conclusions:** This is the first study to report community pharmacy owners’ perceptions of PBPPMs. The use of financial measures within Medicare is intriguing and suggests that payers are viewing these as a way to improve Part D plan profits through reductions in prescription drug spending as well as Stars-linked bonuses. Transparency initiatives for measures could alleviate some concerns over these models, as could changes to the fee structure used to implement the models within Medicare Part D.

**Design, Development, and Implementation of a Collaborative Shared Modular Pharmacy Law Course**

Rahul Deshmukh, Rosalind Franklin University of Medicine and Science, Janeen S. Winnike, Rosalind Franklin University of Medicine and Science, Bedrija Nikocevic, Roosevelt University.

**Objective:** A new Pharmacy Law course was designed and implemented between two colleges of pharmacy. The drivers behind this collaboration were as follows: 1. Utilize shared resources to improve the course delivery, 2. Enhance student learning, 3. Enhance collaborative capacity, improve productivity, and solidify sustainability of the long-term delivery of the course, 4. Improve licensure exam performance.

**Methods:** Design. This 3-credit hour hybrid course was developed for delivery in two PharmD programs as a combination of pre-recorded online lectures and in-class content delivery. Each program had the flexibility to offer the course at different times, develop and deliver their own assessments based on the mutually developed and shared content. The courses were individually approved by the curriculum committees of the respective colleges. Delivery and Assessment. The course was offered in P-3 year at RUCOP and RFUMS in spring and fall of 2019, respectively. **Results:** A total of 120 students were enrolled across the two programs, and the content was delivered over a 10-week period. In-person course session started with a quiz, followed by a review of the main highlights of the online lecture and appropriately staggered assessments. The end of course satisfaction was over 85% at both institutions. Other metrics evaluated also rated the course in the 80-100 % range. **Conclusions:** This hybrid law course has been successfully implemented and well received at both institutions. The approach used in this course validates the notion that there is considerable value to the development of collaborative inter-institutional cultures that can help alleviate educator stress and financial resources limiting the long-term delivery of PharmD courses.

**Empowering Community Pharmacists to Manage Vaccine Hesitancy: A Simulation-Based, Assertive Communication Training Program**

Justin Gatwood, *The University of Tennessee*, Chelsea P Renfro, *The University of Tennessee*, Kenneth C. Hohmeier, *The University of Tennessee*, Brittany Nichols, *University of Tennessee Health Science Center*, Brittney Bright, *University of Tennessee Health Science Center*, Sarah Murphy, Tracy M. Hagemann, *The University of Tennessee*.

**Objective:** To improve community pharmacists’ confidence in providing accurate and assertive pneumococcal vaccine recommendations to high-risk adults. **Methods:**

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828
A multi-phase vaccine hesitancy and communication workflow training program was implemented among community pharmacists of a national chain in Tennessee. An online module included content on: 1) pneumococcal vaccine recommendations, 2) communication theory, 3) improvisation techniques, and 4) managing hesitancy in adults. Select pharmacists then participated in two simulated patient encounters. Changes in hesitancy management were assessed at multiple points by Mann-Whitney U tests, and comparisons made between control (no training), partial active (online training only), and full active (simulation and online training). Simulated patient encounter recordings and pharmacist documentation were assessed by members of the research team using a standardized evaluation tool. Results: Across regions, 50 community pharmacists completed the training. Pharmacists’ confidence in addressing and overcoming pneumococcal vaccine hesitancy in adults improved slightly across the time period, but significant change was not realized until after completion of the simulated patient encounter. Specifically, pharmacists felt they were better equipped to handle and less likely to indicate there was nothing they could do to manage hesitant patients (both p<0.05). Despite a focus on streamlining communication, no change was observed across time periods (all p>0.05) in terms of pharmacists agreeing they have time to sufficiently probe about hesitancy with patients. Conclusions: Results suggest that a combination of preparatory online and simulation training can improve pharmacists’ confidence in addressing the pneumococcal vaccine needs of adult patients. Findings will inform an expansion of the training to other adult vaccinations, including influenza and HPV.

Enhancing Active Learning of Root Cause Analysis: An Immersive Medication Error Experience from Multiple Perspectives
Juan M. Hincapie-Castillo, University of Florida, Ikenna F Unigwe, University of Florida College of Pharmacy, Amie J. Goodin, University of Florida, Scott M. Vouri, University of Florida.
Objective: We aimed to redesign the teaching approach for content related to root cause analysis of medication errors within a patient safety and quality PharmD course. The research question was: did the new immersive approach lead to improved attitudes and skills in handling and preventing medication errors? Methods: We created a series of video vignettes showing a medication error from the perspectives of each healthcare team member involved in the error, which consisted of a 38-fold increased dose of an antibiotic in a 16-year-old patient. Students were given a pre-/post-assessment adapted from an existing instrument to measure provider attitudes and skills in medication error prevention and handling via a series of 1-5 Likert-type items. Pre-/post-mean scores were compared per item via Mann-Whitney U tests, with Bonferroni correction. Results: From a class size of n=270, 231 and 163 participated in pre and post-assessments, respectively. Most students positively endorsed attitude items at both assessment intervals, with mean for, “Learning how to improve patient safety is an appropriate use of time in pharmacy school,” at pre-assessment=4.26 (SD 0.75), and post-assessment=4.23 (SD 0.77); p=NS. However, there were significant improvements in skills items: “I am confident in my ability to analyze a case to find the root causes of an error” (pre=3.44, post=3.85; p<0.001), and “I can identify the key factors in systems and processes that could lead to a medication error” (pre=3.55, post=3.88; p<0.001). Conclusions: Following our teaching innovation, students reported significantly improved skills in handling and preventing medication errors. Future work is needed to integrate the cases in an interprofessional education environment; though, this content and accompanying assessment are immediately available for adoption by other colleges of pharmacy.

Evaluating Effectiveness of a Pipeline Program in Impacting Underrepresented Minority Student’s Readiness to Enter Healthcare
LaMarcus T. Wingate, Howard University, Mary Maneno, Howard University, Beverly C. Mims, Howard University, Earl Etienne, Howard University, Tawanna Terry, Howard University.
Objective: The objective of this project is to evaluate the effectiveness of a pipeline program for underrepresented minorities in college with regards to its impact on the participant’s perceived readiness to enter healthcare fields. Methods: A pre-post quasi-experimental study design was employed to assess the effectiveness of a six program administered over four annual cycles in preparing underrepresented minorities in their freshman and sophomore years of college for successful matriculation into healthcare fields such as pharmacy. Surveys with 5-point Likert scale items were developed to evaluate the student’s perceived competency in skills and abilities necessary to succeed in a healthcare professions curriculum. The surveys were administered at baseline and again at the conclusion of the program. Paired samples t-test were used to evaluate if any significant improvement occurred in the students perceived skills and abilities following the conclusion of the program. Results: There were 73 participants in the program of which 83.6% were black and 75.3% were female. Students reported significant improvement in 9 of 12 competencies and skills that were measured during the course of the program. The
highest mean value for an individual Likert scale item at follow-up where a significant improvement was noted was in knowing which types of standardized tests are required for college (mean value = 4.45 and p-value < 0.001). Respondents also indicated significant improvement in knowing what would be expected in a course, finding financial aid, and writing scientific presentations. **Conclusions:** Pipeline programs with tailored content may be a viable means of helping to increase the number of qualified underrepresented minorities entering the healthcare fields.

**Evaluation of a Self-Guided Pharmaceutical Calculations Web-Based Tutorial Program**

David F. Malewski, Touro University California, Shane Desselle, Touro University California, Larry Cacace, Touro University California, Shona Mookerjee, Touro University California.

**Objective:** Evidence suggests that many pharmacy students entering the professional program lack the basic mathematics and pharmaceutical calculations prowess desired. The PharmSeer™ Math Module is a self-paced interactive tutorial available from National Healthcareer Association®. The objectives of this study were to determine its impact on student learning and self-efficacy for performing pharmaceutical calculations. **Methods:** P1 students completed a 42-question quiz prior to students’ being provided access to the tutorial. Students were given approximately 3 weeks to complete the tutorial and given bonus credit for its completion, due approximately 2 weeks into the semester prior to coverage of those concepts in class wherein they also completed the same 42-question quiz. Students also completed an evaluation of their self-efficacy pre- and post-tutorial and a brief survey about the tutorial’s utility. **Results:** Students performed better on several questions and on a composite of the quiz following their use of the tutorial. Statistical differences in performance were seen on some of the more challenging questions such as isotonicity, rate of intravenous infusion, quantity of ingredients in a prescribed cocktail, and pediatric dosing. Self-efficacy was reportedly higher post-tutorial on several dimensions, such as converting mass and volume measurements, calculating pediatric dosages, total parenteral nutrition calculations, and overall. Students agreed with statements regarding the tutorial’s utility and that self-guided, self-paced administration of the tutorial was an appropriate format. **Conclusions:** The PharmSeer™ Math Module might potentially be used in any number of ways to assist with instruction of pharmacy mathematics, including as requirement for completion as students enter the professional program.

**Exploring Students’ Stress and Lived Experiences with Coordinated Block Exam Scheduling**


**Objective:** To (1) evaluate differences in students’ perceived stress between PharmD student cohorts with and without coordinated block scheduling of exams and (2) explore P1 students’ lived experiences with coordinated block scheduling of exams among three foundational medicinal chemistry, pharmaceutics, and pharmacy practice courses in one academic quarter. **Methods:** The Perceived Stress Scale was administered to P1, P2, and P3 students at the end of each quarter during the 2018-2019 academic year to achieve the first objective. Quarterly responses were grouped by the presence of coordinated examinations, and differences between the cohorts were evaluated using ANOVA. A transcendental phenomenological design was employed to achieve the second objective. P1 students enrolled in all three foundational courses were recruited with equal representation of high, medium, and low academic performers. A semi-structured interview guide was developed and employed in conducting key informant interviews to elicit students’ lived experience of coordinated vs. non-coordinated exam schedules. Interview transcripts were reviewed using thematic analysis. **Results:** While students’ perceived stress trended downward between quarters, no statistically significant changes were observed (n=585 students) (p=0.08). Six themes were identified from student interviews (n=10 students). Four themes described a consistent structure of the students’ experience: initial reaction, exam preparation, exam day, and self-reflection. Two additional themes revealed that students’ psychological and cognitive experiences were individual and influenced by past experiences and cohort dynamics. **Conclusions:** Coordinated exam scheduling did not appear to significantly impact student stress levels. There were perceived benefits to student learning as well as design- and implementation-related implications to develop an effective coordinated exam schedule and structure.

**Factors Motivating Pharmacist Participation in Community Pharmacy-Based Naloxone Services in the Deep South**

Lindsey Hohmann, Brent Fox, Auburn University, Kimberly B. Garza, Auburn University, Chih-Hsuan Wang, Auburn University, Denton (Beau) Scott, Auburn University, Christopher Correia, Auburn University, Geoff M. Curran, University of Arkansas for Medical Sciences, Salisa C. Westrick, Auburn University.
Objective: Alabama has the highest opioid prescribing rate in the nation. However, community pharmacies are not dispensing naloxone to capacity. To best support naloxone services implementation, we need to better understand factors motivating adoption. Therefore, the objective was to assess which factors most and least motivate Alabama community pharmacists to participate in naloxone services. Methods: A cross-sectional survey was utilized within a larger RCT. Pharmacists in 20 Alabama counties with highest opioid overdose mortality rates were recruited via mail/fax/phone. Naloxone service motivation factors were measured using a 17-item online instrument with Likert-type scales (1=strongly disagree, 7=strongly agree), adapted from Kennedy and Fiss’ (2009) Motivations for Adopting Innovation Model. Motivation scales were conceptualized as: 1) economic gains/losses; 2) social gains/losses; 3) opportunity/threat framing; and 4) technical efficacy/social legitimacy. Mean scale scores were compared using two-sided paired sample t-tests (alpha=0.05). Internal consistency was measured using Cronbach’s alpha. Results: Sixty-four pharmacists completed the survey; most were white (80.6%), female (80.3%), and employed in independently owned pharmacies (50.2%). Internal consistency was moderate to high (range=0.618-0.867). Social gains had the highest mean (SD) scale score (5.88 [0.85]), while economic losses had the lowest (4.24 [1.43]). There was a statistically significant difference in motivation for economic gains over economic losses (mean difference: 0.32, p=0.021), social gains over social losses (0.90, p<0.0005), social legitimacy over technical efficacy (1.03, p<0.0005), and opportunity over threat framing (0.61, p<0.0005). Conclusions: Pharmacists were most motivated to participate in naloxone services by social gains. Results are limited to Alabama but may apply to other states with similar naloxone access laws. Future studies should leverage pharmacists’ motivation to provide naloxone services by fostering a sense of professional fulfillment and helping patients (social gains).

Gallup’s Big Six Experiences in Three Cohorts of Pharmacy Students
Nicholas E. Hagemeier, East Tennessee State University, Sarah Gentry, East Tennessee State University.
Objective: To describe pharmacy students’ perceptions of experiencing Gallup’s Big Six while enrolled in the professional program. Methods: In October 2019, first (P1)-, second (P2)-, and third (P3)-professional year students completed a brief assessment that explored their perceptions of experiencing Gallup’s Big Six while enrolled in the professional program. Items explored student perceptions of having at least one professor who made them excited about learning, having professors that care about them as people, having a mentor who encourages them to pursue hopes and dreams, having worked on a project that took a semester or more to complete, having an internship or job through which learning can be applied, and extremely active engagement in extracurricular activities. Items were responded to using a 5-point Likert scale and thereafter dichotomized based on Gallup precedent. Chi-square tests were employed to explore differences in Big Six experiences across professional (P2 vs P3) year. Results: A response rate of 100% was achieved (N=226). Overall, less than 1 percent (N=1) of students strongly agreed they had all six experiences. Students most commonly reported having a professor that makes them excited about learning (93%) and having professors who care about them as people (77%). Being extremely active in extracurricular activities was reported least often (50%). No statistically significant differences in number of Big Six experiences were noted across P2 and P3 students. Conclusions: In alignment with Gallup data specific to undergraduate students, experiencing the Big Six was the exception rather than the norm in the professional program. Further research is warranted to explore the extent to which the remaining P3 year and the P4 year contribute to Big Six experiences.

Health Disparities, Cultural Competence, and Health Literacy Content Integration in US and Canadian Pharmacy Curricula
Aleida M. Chen, Cedarville University, Anastasia L. Armbuster, St. Louis College of Pharmacy, Nancy Borj-Hart, The University of Tennessee, Elizabeth A. Buckley, Concordia University Wisconsin, Khanh (Devra) Dang, University of Connecticut, Radhika Devraj, Southern Illinois University Edwardsville, Akesha Edwards, The University of Tennessee, Natasha J. Petry, North Dakota State University, Lourdes G. Planas, The University of Oklahoma, Cheryl A. Sadowski, University of Alberta, Jennifer A. Santee, University of Missouri-Kansas City, Latasha Wade, University of Maryland Eastern Shore.
Objective: With the expansion of accreditation standards emphasizing health disparities, cultural competence, and health literacy (HDCC/HL) content, a reassessment of HDCC/HL curricular integration is essential. The objective of this project was to survey US and Canadian pharmacy schools/colleges regarding HDCC/HL curricular integration and assessment. Methods: A survey created from a literature review underwent an iterative process by a multi-institutional research team until
consensus was attained. After piloting at several institutions, the survey was distributed to all US/Canadian schools, with two reminders and a follow-up phone call/email. **Results:** With 50.3% (US:N=72) and 80.0% (Canada:N=8) responding, HDCC was typically addressed in multiple courses across multiple years (MCMY, US: 60.6%, Canada: 75.0%). HL content integration was highly variable; most Canadian schools (75.0%) reported delivery in multiple courses in a single year (MCSY) and US schools (48.6%) in MCMY. Most US schools addressed HDCC concepts at the introductory or reinforcement level (HD: 24.6%/67.7%); community strategies (50.8%/26.2%; bias/ stereotyping: 44.6%/44.6%; cross-cultural communication: 32.3%/46.2%; self-reflection: 35.4%/41.5%; interpreters: 54.7%/20.3%). In Canadian schools, HDCC concepts were taught in 25-62.5% of schools at the introductory/reinforcement level. Most US and Canadian schools also taught HL concepts, focusing on the scope of the problem (US: 79.4%, Canada: 75.0%) and communication strategies (US: 93.4%, Canada: 75.0%). Few schools required HDCC-specific experiences within IPPEs and APPEs (US: 22.2%/16.7%, Canada: 12.5%/12.5%) and the co-curriculum (US: 22.2%, Canada: 12.5%) and have limited data collection related to specific patient populations on IPPEs/APPEs (US: 33.3%/40.4%, Canada: 0%/12.5%). **Conclusions:** Though pharmacy programs in the US and Canada have wide coverage of HDCC/HL-related content, less content is required and collected within the experiential and co-curriculum. Opportunities remain to expand and collect information on HDCC/HL content, particularly outside the didactic curriculum.

**Longitudinal Assessment of Pharm.D. Student Stress and Satisfaction**
Mark A. Munger, The University of Utah, Casey Tak, University of North Carolina at Chapel Hill, Craig P. Henchey, The University of Utah, Surajit Dey, Roseman University of Health Sciences, Michael Feehan, Kantar, LLC.

**Objective:** To gauge the relationship over time between students’ satisfaction, stress, and professionalism with the University of Utah’s Pharm.D. Program, using annual surveys. **Methods:** An online survey of P1-P4 students was conducted from 2015-2019 to longitudinally gauge the degree of students’ professionalism (eg, personal reflection, patient-centric care focus, efficacy), program satisfaction (eg, overall satisfaction, likelihood to recommend the program), and stress (eg, burnout, exhaustion, intent to quit the program). Descriptive statistics characterized the respondents and their responses. Data were analyzed in SAS v9.4. **Results:** There were 792 survey responses across the 5 years of surveys with a response rate of 86.2%. The study population was 51% female with a mean age of 26.7±3.3 years. Professional efficacy was equivalent across P1-P4 years. Curriculum satisfaction and likelihood to recommend the program were highest in the P1 year, declined in the P2 and recovered in the P3 and P4 years (not reaching P1 levels for program recommendation). Stress and burnout were lowest in the P1 year, peaked in the P3 year and declined slightly in the P4 year. Exhaustion and cynicism were highest in the P2 and P3 years. Students’ thoughts about quitting the program were the lowest in the P1 and P4 years. **Conclusions:** In a longitudinal assessment of professionalism, satisfaction, and stress of Pharm.D. Students across P1-P4 years, all classes feel competent to practice. Students have the highest satisfaction in the P1 year, declining in the P2-P3 year associated with increased program rigor, and recover to a degree by the P4 year, with stress and satisfaction having similar trends over time. These results support increased student understanding and addressing learning issues during a Pharm.D. Program’s most rigorous years.

**Older Adults’ Preferences for Features of Community-based Fall Prevention Programs: A Discrete Choice Experiment**
Natalie Hohmann, Jingjing Qian, Auburn University, Salisa C. Westrick, Auburn University, Caralise Hunt, Auburn University, Ana L. Hincapie, University of Cincinnati, Kimberly B. Garza, Auburn University.

**Objective:** Falls are the leading cause of injury-related death and non-fatal injuries in US older adults, including hip fracture and traumatic brain injury. Current evidence-based fall prevention programs exist in community settings, but are under-utilized. Thus, the purpose of this study is to quantify community-dwelling older adults’ (65+) preferences for features of community-based fall prevention (CFP) programs. **Methods:** A discrete choice experiment (DCE) survey was used to quantitatively prioritize preferred CFP program features. Older adults were recruited from a national online Qualtrics survey panel. Each participant answered 8 DCE choice tasks, where they chose between two hypothetical CFP programs with 5 varying features (cost, location, frequency, efficacy, and inclusion of a home safety consultation). DCE preference results were analyzed using conditional logit models in SAS. Ratios of preference weights were standardized on a 0-100 scale (where 100 is most important) to obtain relative importance scores for each CFP program feature. **Results:** Only participants who made trade-offs between CFP program attributes and who correctly answered attention filter questions were included in analyses (n=328). Conditional logit model results showed that cost was the most important factor in older adults’ choice between CFP programs (relative importance score, RIS=78.2). This was followed by
session frequency (RIS=6.5), fall prevention efficacy (RIS=6.5), and location (RIS=6.4). Inclusion of a home safety consultation was least important (RIS=2.4). **Conclusions:** Cost was the most important CFP program feature to older adults. To engage older adults, service providers may prioritize low-cost programs that optimize session frequency, location, and fall prevention efficacy. More work is needed to best incorporate extra features like consultations into community-based programming for older adults.

**PCOA Scores as Predictors of Practice NAPLEX Scores**
Jean T. Carter, University of Montana, Donna G. Beall, University of Montana, Kendra Procacci, University of Montana.

**Objective:** To determine whether P3 student performance on the PCOA would be a predictor of P4 student performance on a practice NAPLEX exam. **Methods:** Individual student scores on the PCOA and practice NAPLEX exams were collected for students graduating in spring 2019. This was the first year both sets of scores were available for comparison. Using only scores for students who completed both standardized exams, analysis looked at correlations by scaled total PCOA scores and total scores for the practice NAPLEX. The scores were also ranked as top, middle and bottom performers in both exams then changes in rank from NAPLEX. The scores were also ranked as top, middle and bottom performers in both exams then changes in rank from PCOA in the P3 year to the practice NAPLEX in the P4 year were analyzed. The analysis will be repeated in May 2020 when the second set of data are available. **Results:** Of the 59 graduating students in spring 2019, 51 (86%) had both scores for the analyses. The Pearson’s r correlation of PCOA and practice NAPLEX scores was significantly correlated at r(49) = 0.604, p < 0.00001. Student PCOA scaled scores were ranked as top (≥370 n = 17), middle (334-369 n = 17), and bottom (<334 n = 17). Practice NAPLEX scores ranked as top (≥75 n = 18), middle (70-74 n = 13), and bottom (<70 n = 20). Change in rank group from P3 PCOA to P4 practice NAPLEX showed a majority remained in the same rank (n=29) while 9 improved rank and 13 dropped one or more levels. **Conclusions:** This is an initial exploration of how well PCOA performance predicts practice NAPLEX performance seems to indicate a strong correlation. Additional data from spring 2020 will be used to further explore and validate this finding.

**Pragmatic Model for PharmD Student Engagement in Social and Administrative Pharmacy Research: UF Opioid Research Workgroup**
Amie J. Goodin, University of Florida, Juan M. Hincapie-Castillo, University of Florida, Scott M. Vouri, University of Florida.

**Objective:** We aimed to implement a new model for student engagement in social and administrative pharmacy research by developing a workgroup consisting of faculty and students with shared interests in evaluating policy responses to the opioid epidemic. **Methods:** In summer of 2019, 3 faculty with diverse education and training backgrounds recruited and established a workgroup consisting of: 15 first-year pharmacy students, 4 research interns, and 3 advanced graduate trainees. A hierarchical leadership model of supervision was employed, whereby pharmacy students reported directly to an advanced graduate trainee leading a project team, who in turn reported to a faculty lead. Initial research projects included 3 systematic literature reviews with responsibilities divided among all members of individual project teams. Weekly live and videoconference meetings were held, where the workgroup discussed each project’s progress and output. As student research skills advanced, the workgroup progressed by initiating analytical projects using prescription claims data. **Results:** The workgroup initiated 11 individual projects related to opioid policy. Workgroup teams have submitted 5 conference abstracts (2 published, 3 under review) and 4 manuscripts (1 published, 3 under review) since inception. Workshop meetings maintain steady attendance and all initial student members have been successfully retained. Student engagement in meetings and research contributions are exceptional, and new students are seeking to join due to peer reports of gaining important skills in literature evaluation, medical writing, and data analysis. **Conclusions:** Our pragmatic model of pharmacy student engagement in research can be applied widely, and faculty can leverage this approach to increase productivity in research output. We hypothesize that early research engagement will prepare students to pursue further clinical and research training opportunities.

**Promoting Educational Research Through School-Based Peer Review**
Adam M. Persky, University of North Carolina at Chapel Hill, Jacqueline McLaughlin, University of North Carolina at Chapel Hill.

**Objective:** To examine the impact of an institutional approach to increase productivity in research output. We hypothesize that early research engagement will prepare students to pursue further clinical and research training opportunities.
The Evolution of One College’s Licensure Preparedness Program
C. Lea Winkles, Mercer University, Jill M. Augustine, Mercer University, Candace W. Barnett, Mercer University.
Objective: To describe the evolution of a licensure preparedness program (LPP) and its relationship to the North American Pharmacist Licensure Exam (NAPLEX) first-time pass rate over three cohorts at one college of pharmacy.
Methods: A LPP was implemented for fourth-year students to assist in preparation for NAPLEX. The program included a variety of assessments, online tutorials, and a textbook. Program administrators collected feedback for programmatic improvement. NAPLEX first-time pass rates were monitored and programmatic changes made accordingly. Chi-square tests compared first-time pass rates for trimester two (May to August).
Results: The LPP was a pilot program for the Class of 2017. Volunteers (n=50) completed individual chapter exams in biostatistics, calculations and a practice licensure exam. For the Class of 2018 (n=155), the LPP was a co-curricular requirement and included individual chapter exams only. For this cohort, a minimum score (80%) was required. Students were able to take exams as many times as necessary to achieve this score. For the Class of 2019 (n=135), the program evolved to include individual chapter exams, cumulative chapter exams, and a minimum score (70%) on a practice licensure exam. No significant differences occurred in NAPLEX first-time pass rates between Classes of 2017 (84.24%) and 2018 (76.55%), p=0.125; there was a significant increase in the pass rate for Class of 2019 (95.12%) compared to Class of 2018 (p<0.001) and compared to Class of 2017 (p=0.02).
Conclusions: The LPP evolved over time to include individual chapter, cumulative chapter, and practice licensure exams. Requiring students to complete individual and cumulative chapter exams and score at or above 70% on a practice licensure exam is associated with an increase in NAPLEX first-time pass rates.

The Focus of Societal Responsibility in the Mission Statements of US Pharmacy Schools/Colleges
Mohammed A. Islam, American University of Health Sciences, Suhui Yang, American University of Health Sciences, Radhika Venkatraman Kumar, American University of Health Sciences, Arjun P. Dutta, American University of Health Sciences, Rahmat M. Talukder, The University of Texas at Tyler.
Objective: To explore the focus of societal responsibility in the mission statements of US pharmacy schools/colleges. Methods: The websites of US pharmacy schools/colleges were visited from the listing of Accreditation Council for Pharmacy Education. Mission statements from a total of 83 pharmacy schools/colleges were collected and combined in one Microsoft Excel spreadsheet. The combined file was then uploaded in NVivo (version 12), a qualitative data analysis software. The websites were inspected for the mission statements. A list of 26 predefined codes were developed and organized in nodes with the relevant sources for each code. Textual analysis was performed to count the frequency of citation of each code (one or multi-word). Each word citation in the NVivo spreadsheet was manually checked to cross-check the associated themes. A systematic content analysis method was used. Results: The five most frequent themes in the mission statements were “education” (citation=161), “research” (145), “service” (96) “practice” (90), and “community” (53). “Leadership” was cited in 46 statements. The words “patient care”, “healthcare”, and “community service” were cited in 49, 41, and 3 mission statements, respectively. The words “underserved”, “diversity” and “minority” were cited in 12, 12, and 3 mission statements only. Conclusions: The predominant themes emerged in the mission statements are related to education and research. The textual analysis of the mission statements revealed a lack of emphasis on the societal responsibility towards underprivileged population in the mission statements of US pharmacy schools/colleges.
With the increased attention in the healthcare of diverse population, the expression of social commitment in mission statements is needed.

The Impact of a Peer Mentorship Program Matching Process on Participant Satisfaction
Kelsey K Clayton, Meghan McTavish, Amy D. Grant, University of South Carolina.

Objective: To determine the effects of a preference-based matching process on participant satisfaction in a peer mentoring program. Methods: One hundred and ten first-year pharmacy students (mentees) were assigned to 1 of 50 second-year pharmacy student volunteer mentors through a peer mentorship program. Prior to the matching process, mentees and mentors were asked to complete an informational questionnaire. Mentors were additionally asked to post biographies on a social media platform. Mentees and mentors received a spreadsheet summarizing participant demographics, use of pre-match information, and satisfaction of the matching process. Results: Survey responses were received from 110 mentees and 44 mentors. 81.8% of mentees and 74% of mentors utilized at least one type of social media platform to evaluate compatibility with peers. Results are presented as survey summary and chart data. Conclusions: Mentors received a spreadsheet summarizing participant biographies on a social media platform. Mentees and mentors were able to view mentor biographies on a social media platform. All participants were asked to submit their top 4 mentor/mentee preferences. A survey was administered to all mentees and mentors after one semester to determine participant demographics, use of pre-match information, and satisfaction of the matching process. Results: Survey responses were received from 110 mentees and 44 mentors. 81.8% of mentees and 74% of mentors utilized at least one type of social media platform to evaluate compatibility with peers. Three mentees solely utilized the summary spreadsheet. 67.3% of mentees and 62% of mentors were satisfied or extremely satisfied that a pointed questionnaire provided adequate compatibility information. 71.8% of mentees and 62% of mentors were satisfied or extremely satisfied with the social media platform that contained mentor and mentee characteristics, background and interest information. Once matched, 69% of mentee-mentor matches communicated at minimum once per month, while 16.4% of pairs communicated at least once per week throughout the semester. Conclusions: Pharmacy students utilize social media and characteristic/interest documents to determine compatibility with peers. Ability to submit pre-match preferences leads to participant satisfaction of mentor-mentee matches. This matching process format is sustainable and reproducible in other professional programs.

The Impact of Competency Training on Pharmacy Students’ Emotional Intelligence, Cultural Competency and Cultural Awareness
Imbi Drame, Howard University, LaMarcus T. Wingate, Howard University, Jacquiese Unonu, Howard University, Malaika R Turner, Howard University, Montrell Taylor, Andrea Bush, Tatyana Cawthorne, Mariecus Jarvis.

Objective: The objective of this study was determine the impact of cultural competence training on first-year pharmacy students’ level of cultural competence (CC), cultural awareness (CA), and emotional intelligence (EI). As a secondary endpoint, relationships between CC, CA, and EI were explored. Methods: An interventional pre-post study was used to evaluate outcomes in a cohort of 46 first-year pharmacy students. Students were administered three validated surveys during 2016 and 2017 to assess scores related to cultural awareness, cultural competence, and emotional intelligence. Survey responses were collected at baseline and after the cultural competence training was provided. Descriptive statistics were used to characterize performance on each of the three scales. Pearson’s correlation was used to determine statistical significance of relationships between CC, CA, and EI. Results: Forty-one students responded to the pre and post-survey, thirty-four percent of which had previous cultural competence training. Students previously exposed to cultural competence training scored significantly higher on the cultural competence scale compared to colleagues without prior exposure (p=0.004). The self-cultural scale (part of the cultural awareness assessment) was significantly associated with a higher level of emotional intelligence (p=0.020). Previous cultural competence training was associated with enhanced ability to perceive one’s own emotions as measured by the emotional intelligence scale (p=0.016). Conclusions: Despite having a high level of cultural self-awareness and emotional intelligence, increasing cultural competence may be difficult to achieve without continuous training.

Training Student Pharmacists in Suicide Prevention as Part of a Pharmacotherapy Course
Matthew Witry, The University of Iowa, Jill Kauer, The University of Iowa, Michelle A. Fravel, The University of Iowa, Jeffrey C. Reist, The University of Iowa.

Objective: Suicide has been labeled a public health crisis. Training student pharmacists in suicide prevention has been recommended. Study objectives were to test self-efficacy and reluctance change associated with student pharmacists undergoing Question Persuade Refer (QPR) training and discussion sessions. Methods: A community QPR trainer led 3 sessions as part of a Neurology-Psychiatry Integrated Pharmacotherapy course for second-year student pharmacists at a 4-year public pharmacy college. Students also attended an additional discussion section led by a psychiatric pharmacist. Pre and post online surveys were used to evaluate the program for changes in self-efficacy (7-items) and reluctance (8-items) using established instruments. Likelihood to intervene and previous work and personal experience with
persons making concerning statements related to suicide were assessed. Analyses included descriptive statistics, paired t-tests, and ordinal regression. **Results:** All 111 students responded to both pre and post surveys. Students showed significant improvements in their self-efficacy (p<.001) and reluctance (p<.001) related to suicide prevention. Three-quarters of students (73.0%) reported being very or extremely likely to intervene the next time they see warning signs of suicide. Self-efficacy was significantly associated with future likelihood to intervene (p=0.02). Students reported being told concerning statements suggesting suicidal ideation in their personal lives (55.9% = yes, 15.3% maybe) and at work (12.6% = yes, 21.6%=maybe). **Conclusions:** This educational intervention to train student pharmacists in QPR and engage with a psychiatric pharmacist was associated with a significant increase in self-efficacy and reluctance scores related to suicide gatekeeping. The responses also showed a positive association between self-efficacy and likelihood to intervene in the future with persons with warning signs of suicide. Students already had personal and work experiences with people they thought may be thinking about suicide.

**Understanding Pharmacy Schools’ Experiences with the Highest Levels of Curricular Integration: A Mixed Methods Study**

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**Objective:** To gain an in-depth understanding of the experiences of pharmacy schools developing and implementing the highest levels of integrated curricula.

**Methods:** An explanatory sequential mixed method study was performed to investigate the highest levels of curricular integration within pharmacy schools. The quantitative phase involved an online survey administered to 30 purposely sampled curriculum administrators. The qualitative phase involved structured interviews that expanded on quantitative findings. One-hour video recorded interviews were performed with 10 administrators and transcribed verbatim. A blended mixed method analysis was performed.

**Results:** Survey response rate was 50% (n=15). Varying levels and definitions of integration were reported. Sixty-nine percent (n=10) of schools reported that most subject matter was explicitly linked. Tension was a major theme uncovered: tension between schools wanting cohesive courses while also respecting academic freedom; tensions regarding depth of content; and tension between productivity, sustainability, and creativity. Pharmacy schools reported determining success in a variety of ways: residency match rates (n=13), NAPLEX scores (n=13), job offers after graduation (n=11), and student feedback (n=12). Most participants stated that grades are not the most important measure of success; the more integrated schools became the less weight they gave to grades. This led to tensions between school assessment and residency requirements, as well as, tensions between students being practice-ready versus licensure/exam ready. **Conclusions:** Results indicate that pharmacy schools are finding value with curricular integration but are struggling to resolve new tensions that come with the transition. Future research should focus on improving assessment strategies targeted at integrated curricula, creating a framework to guide the development and implementation of integrated curricula, and strategies to implement a sustainable highly integrated curriculum within pharmacy schools.

**Using Interprofessional Team Debates as a Teaching Modality for Nursing and Pharmacy Students**

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**Objective:** A core competency of interprofessional education (IPE) is shared values and ethics. Prior IPE ethics’ sessions were unfavorable by students due to limited interactions between disciplines, and redundancy in curriculum. To prepare nursing and pharmacy students for ethical decision-making in practice, three ethical topics were developed for IP teams to debate. The objectives of this pilot study were to measure whether the debates would improve students’ perceived satisfaction and achievement of IPE competencies. **Methods:** IRB-approved exploratory study of undergraduate nursing and third year pharmacy students was conducted. One week prior to the IPE session, students received a contemporary healthcare ethical scenario and a stance to research. During the session, interprofessional student teams were asked for a unified opening statement, arguments, and closing argument. Scenarios were dramatized by theater students, and peer trial by jury reached the verdicts. At the end, students received an 11-question survey to measure satisfaction and IPE competencies.

**Results:** Total of 114 students participated in the survey. 65% were nursing students, 60% were between the ages of 18-24, 55% were Caucasian, and 86% were females. 96.7% of students reported increased ability to maintain a climate of mutual respect and shared value after the session, and 96.7% reported using principles of team dynamics. 96.6% reported better knowledge of their role and those of other professions to address patients’ healthcare needs. 68% of students rated their satisfaction as above average and good. **Conclusions:** An IPE session debating ethical topics allowed students to understand unique and shared roles and ethical responsibilities. Students practiced
shared problem solving by analyzing ethical issues, established collaborative working relationships, and gained an appreciation of the importance of maintaining high ethical standards in practice.

Using the Multiple Mini Interview to Assess Candidates for a PhD Program in Pharmaceutical Sciences

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Objective: The purpose of this study was to evaluate the Multiple Mini Interview (MMI) as an interview strategy for doctor of philosophy (PhD) candidates in pharmaceutical sciences. Methods: In 2019 and 2020, candidates interviewing for the PhD program at the UNC Eshelman School of Pharmacy completed a 4-station MMI. Each station was designed to evaluate a single construct (eg, integrity, creativity) and candidates were scored from “1-poor” to “10-exceptional” at each station. Comments left by evaluators were independently coded as “1”-positive, “0”-neutral, or “-1”-negative. Candidates were surveyed after recruitment regarding their MMI perceptions using a five-point agreement scale. Descriptive statistics were used to explore the data; Cronbach’s alpha (α) to examine reliability within each station; and Pearson correlations (rp) to examine the relationships between stations. Continuous data are presented as mean±standard deviation and categorical data are presented as number(%). Statistical significance was established at p<.05. Results: Sixty-three candidates completed the MMI in 2019 (n=27, 42.86%) and 2020 (n=36, 57.14%). Thirty-one evaluators represented all 4 of the School’s PhD divisions (n=18 in 2019; n=17 in 2020). Scores ranged from 5.83±1.73 to 7.29±1.31 with high reliabilities (α>.90) and low correlations between most stations (rp<.3). Most of the 189 evaluator comments were positive (n=106, 56.08%); however, 16 candidates (25.40%) had at least one positive and one negative comment. Of those candidates that completed the survey (n=42, 66.67% response rate), most agreed that the MMI showcased their ability to demonstrate effective communication (4.40±.91), argumentation (4.30±.97), critical thinking (4.45±.89), and teamwork (4.39±1.00). Conclusions: The MMI is an acceptable interview strategy for graduate programs. More work is needed to understand faculty and student perceptions, along with the predictive validity of MMI data once candidates enroll.

Utilization of Cognitive Interviews to Create the Kiersma-Chen Empathy Scale-Revised (KCES-R)

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Objective: The Kiersma-Chen Empathy Scale (KCES) has been used in over 80 studies internationally to assess empathy expressed by health professional students. The objective of this study was to re-evaluate the KCES based upon cognitive interviews with student pharmacists. Methods: Prior psychometric data indicated potential issues with negatively-worded items and significant correlations between the affective and cognitive domains. Twenty pre-pharmacy and professional pharmacy program students completed cognitive interviews regarding their thought processes as they answered the KCES. The 15 items of the KCES were read to the students, who were asked probing questions to provide insight into their understanding of, retrieval of information for, judgment related to, response to, and adequacy of the items. After transcription, data were analyzed for themes. Results: Based upon the cognitive interviews, the negatively-worded items were deemed confusing. Alternate scaling was discussed during the interviews, and consensus was achieved regarding the utilization of a necessity scale versus agreement. Further, students indicated that there were significant differences in their own abilities versus the requirements of healthcare providers. When reading items, students often did not know which perspective to answer. Thus, the KCES was revised (KCES-R) containing two subscales: global healthcare professional empathy ratings and self-perceived empathy ratings. The two subscales are each comprised of seven items with parallel statements and a revised rating scale regarding necessity. Conclusions: Cognitive interviewing is a helpful tool when revising survey instruments. The cognitive interviews provided meaningful information on challenges when completing the KCES and assisted in developing the KCES-R. Further psychometric validation is needed regarding the KCES-R.