

Eugene Applebaum College of Pharmacy and Health Sciences

18th Annual College Research Day

Wednesday, October 20, 2021



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Organizing Committees

Research Committee

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Agenda

10 a.m.	Welcome Dean Brian Cummings, Ph.D.
10:10 a.m.	Welcome from Research Committee Diane Adamo, Ph.D., M.S., OTR
10:15 a.m.	Keynote Address Introduction: Susan Davis, PharmD. Keynote Address: Arthur Kim, MD
10:45 a.m.	Keynote Question and Answer Arthur Kim, MD
11 a.m.	Presentation of Awards STUDENT RESEARCH AWARDS Jennifer Dickson, PT, DPT, OMPT
11:15 a.m.	Closing Remarks Dean Brian Cummings, Ph.D.

Keynote Speaker: Arthur Kim, MD



Arthur Kim, MD, is the Director of the Viral Hepatitis Clinic in the Division of Infectious Diseases at Massachusetts General Hospital and Associate Professor of Medicine at Harvard Medical School. He received his medical degree at Harvard Medical School and trained in internal medicine at MGH and infectious diseases at MGH/Brigham and Women's Hospital.

Dr. Kim expresses a longstanding interest in those living with HCV, especially in special populations such as acute infection, prisoners, post-transplantation, and HIV co-infection. He currently is co-PI or co-investigator of NIH-funded studies examining the immunology and immunogenetics of HCV infection. Dr. Kim serves on the AASLD/IDSA committee that provides online guidance at <http://hcvguidelines.org>.

He focuses on HBV, HCV, and HIV/HCV co-infected patients and especially welcomes referrals of those suspected to have early or acute infection and/or with a history of drug use. Dr. Kim also has many years of experience with inpatient transplant infectious disease and outpatient travel advice.

Abstracts

Postdoctoral Scholars

ABSTRACT PD01	
Name	Sara Alosaimy
Category	Post doc
Title	<u>Standardized Treatment and Assessment Pathway Improves Mortality in Adults with Methicillin-resistant Staphylococcus aureus Bacteremia: STAPH-Study</u>
Authors	<p>Authors:</p> <p>Sara ALOSAIMY¹, Abdalhamid M. LAGNF¹, Taylor MORRISETTE¹, Sarah CJ JORGENSEN^{1,2*}, Trang D. TRINH^{1,3*}, Evan J ZASOWSKI^{1,4*}, Marco R SCIPIONE⁵, Jing J ZHAO⁶, Ryan MYNATT^{7-8*}, Shelbye HERBIN⁵, Sorabh DHAR⁸⁻⁹, Teena CHOPRA^{8,10}, James JANISSE¹¹, Nicholas REBOLD¹, Jason M POGUE^{8,12*}, Michael J. RYBAK^{1,5,11}</p>
Abstract	<p>Introduction: Methicillin-resistant Staphylococcus aureus (MRSA) bloodstream infections (BSI) management remains challenging for clinicians. Numerous in vitro studies report synergy when vancomycin (VAN)/daptomycin (DAP) were combined with beta-lactams (BL), which has led to clinical implementation of these combinations in our institution. While shorter durations of bacteremia have often been reported, there has been no significant impact on mortality.</p> <p>Objective: To assess the independent impact of a clinical pathway algorithm on 30-day mortality.</p> <p>Methods: The Detroit Medical Center (DMC) developed and implemented a clinical pathway algorithm for MRSA BSI treatment in 2016 that included the early use of BL combination therapy with standard-of-care (VAN or DAP) and a mandatory infectious diseases consultation. This was a retrospective, quasi-experimental study at the DMC between 2013-2020. Multivariable logistic regression was used to assess the independent association between pathway implementation and 30-day mortality while adjusting for confounding variables.</p> <p>Results: Overall, 813 adult patients treated for MRSA BSI were evaluated. Compared to pre-pathway (PRE) patients (n=379), those treated post-pathway (POST) (n=434) had a significant reduction in 30-day and 90-day mortality; 9.7% vs. 15.6% in PRE (p=0.011) and 12.2% in POST vs. 19.0% in PRE (p=0.007). The incidence of acute kidney injury (AKI) was higher in the PRE compared to POST; 9.6% vs. 7.2% (p=0.282), respectively. After adjusting for confounding variables including infectious diseases consult, POST was independently associated with a reduction in 30-day mortality (adjusted odds ratio [aOR], 0.608; 95% confidence interval [CI], 0.375-0.986).</p> <p>Conclusion: Implementation of a MRSA BSI treatment pathway with early use of BL reduced mortality with no increased in AKI. Further prospective evaluation of this pathway approach is warranted.</p>

ABSTRACT PD02	
Name	Somrita Dey
Category	Post doc
Title	<u>Overcoming drug resistance in pancreatic cancer using novel gemcitabine analogs</u>
Authors	Somrita Dey Ph.D, Samaresh Sau Ph.D, Hariprasad Aruri Ph.D, Navnath Gavande Ph.D, Arun K. Iyer Ph.D
Abstract	<p>Introduction: Pancreatic cancer (PC) is the deadliest tumor with the five-year survival rate of 10%. To date, chemotherapies, such as gemcitabine (GEM) or nab-paclitaxel are the FDA-approved treatment options in combination with other drugs. Due to the limited treatment options, many patients with PC cannot benefit from GEM, and patients rapidly develop GEM resistance. GEM resistance in PC is attributed to multiple factors including, low uptake of GEM in PC cells due to downregulation of gemcitabine transporter (hENT), non-specific inactivation of GEM by cytidine deaminase (CDA) enzymes, impairment of the apoptosis, high expression of drug efflux pumps (ABC transporters), activation of epithelial-to-mesenchymal transition (EMT) pathway, and poor drug penetration due to the presence of dense desmoplastic stroma.</p> <p>Objectives: This study aims to evaluate the benefit of newly synthesized GEM-analogs (GEM-As) for effectively killing various pancreatic cancer cells (Aspc-1, Panc1, MIA-PaCa-2) and overcoming GEM resistance.</p> <p>Methods: We performed the cell cytotoxicity assay of four GEM-As, namely, GL, GOM, GL-349, GL-351, and commercial GEM in Aspc1 PC. The cell-killing efficiency of GEM-As was validated in tumor mimetic 3D spheroid culture. HPLC was performed to determine GEM-As are stable from CDA-mediated metabolism. Western blot analysis was performed in ASPC-1 cells to evaluate the down-regulation of crucial drug-resistant factors. A pilot therapy study was conducted in the Aspc-1 xenograft tumor model to demonstrate the anti-tumor efficiency of GEM-As than GEM.</p> <p>Results: Our studies revealed that some GEM-As, such as GOM and GL, have a significantly higher ASPC-1 cell-killing effect and 3D-spheroid growth inhibition than GEM. GL is stable from CDA mediated deamination, supporting the benefit of GEM-As in overcoming drug resistance. Whereas, GEM was quickly inactivated by CDA. Furthermore, GL can profoundly inhibit tumorigenic kinases, like pAKT and activate pro-apoptosis hallmarks proteins like, PARP and cleaved Caspase 3. Significant tumor volume inhibition was observed with GEM-A treatment compared to vehicle control and GEM in the subcutaneous xenograft tumor model.</p> <p>Conclusion: Our study has significant potential to overcome the clinical challenges of GEM in PC. In support of our preliminary data, the GEM-A strategy can be a potential platform for improving the survivability of drug-resistant PC.</p>

ABSTRACT PD03	
Name	David Henning
Category	Post doc
Title	<u>Validating the Walking While Talking Test to Measures of Motor, Cognitive, and Dual-Task Performance in Ambulatory Individuals with Multiple Sclerosis</u>
Authors	Henning DA; Edwards EM; Ansara M; Fritz NE
Abstract	<p>Introduction: Multiple Sclerosis (MS) is a progressive neurodegenerative disease associated with demyelination of the central nervous system negatively impacting both motor and cognitive ability. Persons with MS have difficulty combining tasks, like talking while walking. Declines in dual-tasking is linked with falls. Dual-task assessment with the Walking While Talking Test (WWTT) is utilized in the clinical setting; however, the validity and minimal detectable change of the WWTT has not been established for persons with MS.</p> <p>Objectives: Establish the WWTT as a valid measure of dual-task function by examining concurrent validity with standard motor, cognitive and dual-task measures, and to establish the minimal detectable change for both conditions of the WWTT.</p> <p>Methods: 38 adults (34 female, aged 49.8(±9.1), with PDDS (Patient Determined Disease Steps; mean 3, range 6) completed the WWTT simple (walk while reciting the alphabet) and complex (walk while reciting every other letter) conditions and a battery of cognitive and motor tests validated for persons with MS. The sample was split into low and high disability groups to observe the impact of PDDS on relationships among WWTT and cognitive and motor function. Spearman correlations examined concurrent validity.</p> <p>Results: Concurrent validity ($p < .001$) was observed for both WWTT conditions and the motor and dual-task measures. Group data showed concurrent cognitive results for the WWTT-simple and the symbol digit modalities test (SDMT, $p < .05$) within the low PDDS group. Results show the validity and use of the WWTT to research cognitive and motor performance and DTE's in persons with MS. Minimal detectable change values were also established for both WWTT conditions.</p> <p>Conclusion: The WWTT is a quick, easy-to-administer clinical measure measuring both motor and cognitive aspects of performance for persons with MS. Clinicians should consider adding the WWTT to the evaluation of persons with MS to examine dual-task performance.</p>

ABSTRACT PD04	
Name	Dana Holger
Category	Post doc
Title	<u>Evaluation of Phage Cocktails in Combination with Ciprofloxacin Against Multidrug-resistant Pseudomonas aeruginosa Overexpressing MexAB-OprM Efflux Systems</u>
Authors	Dana Holger, PharmD; Katherine L. Lev, MS; Natasha Bhutani, PharmD Candidate; Razieh Kebraiee, PhD; Taylor Morrisette, PharmD; Susan M. Lehman, PhD; Jose Alexander, MD; Michael J. Rybak, PharmD, PhD, MPH
Abstract	<p>Introduction: Multidrug-resistant (MDR) Pseudomonas aeruginosa infections are increasing in prevalence and cause significant mortality. The MexAB-OprM efflux system confers resistance to a wide range of drugs, including fluoroquinolones. Obligately lytic bacteriophages (phages) are viruses that infect and kill bacteria. Phage-antibiotic combination therapy has been suggested as an alternative treatment option.</p> <p>Objectives: The objective of this study was to determine the ability of a phage cocktail in combination with ciprofloxacin (CIP) to improve bacterial killing and/or prevent the emergence of phage resistance in MDR P. aeruginosa.</p> <p>Methods: Initial bacterial susceptibility to phage was evaluated with three newly isolated phages (EM, LL, and A6) against ten clinical P.aeruginosa isolates. Theoretical multiplicity of infection (tMOI) optimization was performed with two phages with the broadest initial susceptibility (tMOI: 1.0 chosen for further analysis). A preliminary evaluation was performed with MDR P.aeruginosa R9316 (carbapenem-resistant clinical strain with MexAB-OprM overexpression, as determined previously by quantitative real-time PCR). Synergy for combinations (≥ 2-log₁₀ CFU/mL kill compared to most effective single agent at 24h), bactericidal activity for all samples (≥ 3-log₁₀ CFU/mL reduction at 24h compared to starting inoculum), and phage resistance development were evaluated in time-kill analyses (TKA).</p> <p>Results: R9316 is a MDR P.aeruginosa isolate with a CIP MIC of 2 mg/L. Phage cocktails as monotherapy had little impact on bacterial eradication (reduction: 1.19 log₁₀ CFU/mL). However, the addition of CIP to phage cocktail of EM and LL phages led to synergistic and bactericidal effects (reduction: 3.92 log₁₀ CFU/mL). Furthermore, phage resistance was observed in the phage monotherapy regimens. Whereas the addition of CIP was shown to prevent the emergence of phage resistance in some regimens.</p> <p>Conclusion: Our results show synergistic activity and prevention of phage resistance with phage cocktail-antibiotic combinations against MDR P.aeruginosa. Further research is needed to determine the impact of phage cocktail therapy on additional strains and clinical outcomes.</p>

ABSTRACT PD05	
Name	Ashlan Kunz Coyne
Category	Post doc
Title	<u>Effectiveness and safety of beta-lactam antibiotics with and without therapeutic drug monitoring in patients with Pseudomonas aeruginosa pneumonia or bacteremia</u>
Authors	Ashlan J. Kunz Coyne, PharmD; Mohammad H. AlShaer, PharmD, PhD, BCPS; Anthony M. Casapao, PharmD, MPH; Veena Venugopalan, PharmD; Carmen Isache, MD; Jason Ferreira, PharmD, BCPS, BCCCP, FCCM; Christopher A. Jankowski, PharmD, BCPS, BCIDP
Abstract	<p>Introduction: Pseudomonas aeruginosa (PSAR) remains a frequent cause of nosocomial infections and is difficult to treat due to its multiple resistance mechanisms and limited antipseudomonal agents including beta-lactam antibiotics (BLA). In response to evidence of suboptimal fT>MIC with conventional BLA dosing and emerging PSAR-resistant isolates, optimizing BLA therapy is a necessity. While the integration of BLA TDM is a seemingly appealing option to improve rates of BLA exposure, there remains sparse comparative clinical data defining its role in best practices.</p> <p>Objective: Compare clinical outcomes in hospitalized patients with PSAR pneumonia (PNA) or bloodstream infection (BSI) receiving beta-lactam antibiotic (BLA) infusions with and without the guidance of therapeutic drug monitoring (TDM).</p> <p>Methods: Retrospective, parallel cohort study conducted at two academic medical centers between 2015 and 2020, UF Shands Gainesville, which uses BLA TDM for select patients (TDM) and UF Health Jacksonville, which does not use BLA TDM (non-TDM). All hospitalized adult patients with respiratory or blood culture positive for PSAR who received ≥48 hours of intravenous BLA with in-vitro susceptibility within 72 hours of positive index culture were included.</p> <p>Results: Two-hundred patients were included (TDM n=95; non-TDM n=105). The primary composite outcome of presumed clinical cure occurred in 81% and 75% of the TDM and non-TDM cohorts, respectively (p=0.322). In unadjusted and IPTW-adjusted analyses, TDM-guided BLA therapy was not associated with an increase in presumed clinical cure compared to non-TDM-guided BLA therapy in patients with PSAR PNA or BSI (odds ratio [OR], 0.____; 95% confidence interval [CI], ; adjusted OR, 0.386; 95% CI,). The primary composite outcome of presumed clinical cure occurred in 81% and 75% of the TDM and non-TDM cohorts, respectively (p=0.322).</p> <p>Conclusion: The addition of TDM to BLA infusions was not associated with improved clinical outcomes in patients with PSAR PNA or BSI. Prospective studies are indicated to assess where beta-lactam TDM fits in clinical best practices.</p>

ABSTRACT PD07	
Name	Abdalhamid Lagnf
Category	Post doc
Title	<u>Daptomycin or Linezolid Monotherapy versus Daptomycin or Linezolid Combined with a Beta-lactam for the Treatment of Vancomycin-resistant Enterococcus faecium Bacteremia</u>
Authors	Abdalhamid Lagnf, MBChB, MPH; Nicholas Rebold, PharmD; Sara Alosaimy, PharmD, BCPS; Taylor Morrisette, PharmD; Paige Witucki, MPH Candidate; Dana Holger, PharmD; Michael Veve, PharmD, MPH; Michael J. Rybak, PharmD, MPH, PhD
Abstract	<p>Introduction: Enterococci are among the most dangerous and common causes of healthcare-associated infections in the US. Mortality rates approach 50% for enterococcal bacteremia. Up to 95% of Enterococcus faecium isolates are vancomycin-resistant while vancomycin-resistant enterococci (VRE) prevalence has increased overall. There is limited clinical evidence to support daptomycin (DAP) or linezolid (LZD) monotherapy (MT) versus DAP/LZD combined with a beta-lactam (BL) for treatment of VRE bloodstream infections (BSI).</p> <p>Objectives: To determine if CT results in improved clinical outcomes compared with treatment with MT in patients with VRE BSI.</p> <p>Methods: A retrospective cohort study of adult patients treated with DAP or LZD for VRE-BSI during 2010-2020 at Detroit Medical Center and Henry Ford Hospital was conducted. Monotherapy (MT) was defined as DAP or LZD within 72 hours of index culture and no BL for ≥ 24 hours up to 96 hours following DAP/LZD initiation. Combination therapy (CT) was defined as DAP or LZD plus any BL for ≥ 48 hours within 72 hours of index culture. Primary outcome was composite endpoint of clinical failure defined as: (1) 30-day mortality and/or (2) 60-day recurrence. Secondary outcome was number of total adverse events.</p> <p>Result: A total of 126 patients were included, 70 in the MT group and 56 in the CT group. The median (IQR range) age of the study population was 63.5 (IQR: 51-73) years, (51%) were women, and (63.5%) were African-American. Active BSI at start of study drug MT vs. CT 44.3 vs 73.2%. The primary sources of VRE-BSI were intravenous catheter 28.6%, gastrointestinal tract 23.8%, urinary-related 18.3%. In multivariable analysis, CT was independently associated with reduced odds of clinical failure (aOR 0.348, 95% CI: 0.128-0.94).</p> <p>Conclusion: CT was independently associated with improved clinical outcomes and there was no increase in adverse events. Future studies should be directed to larger sample sizes.</p>

ABSTRACT PD08

Name	Duy Luong
Category	Post doc
Title	<u>Folate Functionalized Lipid Nanoparticles for Targeted Therapy of Methicillin-resistant Staphylococcus Aureus</u>
Authors	Kushal Vanamala, Ketki Bhise, Hiram Sanchez, Razieh Kebriaei, Duy Luong, Samaresh Sau, Hosam Abdelhady, Michael J. Rybak, David Andes, Arun K. Iyer
Abstract	<p>Superbug, Methicillin-resistant Staphylococcus aureus (MRSA) is a highly alarming antibiotic-resistant population of Staphylococcus aureus (S. aureus) bacteria. Vancomycin (VAN) was first approved by FDA in 1988 and is still regarded as the treatment of choice for MRSA. The efficacy of VAN treatment has become less effective due to the development of VAN resistance in MRSA and the potential for nephrotoxicity. This study aims to improve the efficacy of VAN treatment by identifying the folate receptor for MRSA infected tissues and developing folate decorated lipid nanoparticles containing VAN (LVAN). In comparison to conventional VAN, LVAN showed a higher bactericidal effect and a superior ability to inhibit biofilm in MRSA with an enhanced accumulation in MRSA infected thigh tissues and a reduced accumulation in kidney. The results suggested that LVAN is a promising candidate to overcome the current limitations of bacterial resistance and adverse side effects in kidneys found in VAN.</p>

Health Care Sciences Graduate Programs

ABSTRACT H01	
Name	Sarah Abdallah
Category	Health Care Sciences
Title	<u>STRESS LEVELS AND AVAILABILITY OF RESOURCES FOR GRADUATE STUDENTS IN HEALTH CARE PROFESSIONAL PROGRAMS: A PILOT STUDY</u>
Authors	Dickson J., Abdallah S., Bell K., Munroe K., Selby A., Maher S
Abstract	<p>INTRODUCTION: The purpose of this study was to determine if stress levels varied among graduate students in health care professional programs and if available resources were meeting student needs. Researchers hypothesized (1) Stress would be similar among participants; (2) Within a professional program, stress between cohorts would be significantly different; (3) Throughout the academic year, levels of stress would be significantly different; and (4) Participants would report under-utilization of resources.</p> <p>METHODS: A cross-sectional repeated measures design was used. Three hundred fifty-three students across five graduate programs volunteered as participants. Two data collections were completed and included a demographic survey, a life stressor / resource utilization questionnaire, and the Modified Stress Questionnaire.</p> <p>RESULTS: Significant differences were found for six stress domains during the first data collection, and three domains during the second. Nurse anesthesia participants were least stressed and pharmacy participants were most stressed. A significant decrease in stress was found among all programs from midterm (fall semester) to beginning of a semester (winter). Within physical therapy cohorts, third year participants had significantly lower stress, while second year participants had the highest stress. Participants utilized and were satisfied with financial aid, faculty advising, and a peer buddy system. Counseling services were not used by 95% of participants.</p> <p>DISCUSSION: High prevalence of stress was seen in all participants and stressors were consistent among programs. Stress was highest during the second year of physical therapy which may result from increased lab time and courses that require higher-level thinking. Counseling resources were underutilized by participants despite high stress levels.</p> <p>CONCLUSIONS: Further research is needed to implement solutions to decrease stress and increase utilization of available counseling services.</p>

ABSTRACT H03	
Name	Haley Boccomino
Category	Health Care Sciences
Title	<u>LOG-TRANSFORMED ELECTROMYOGRAPHY AMPLITUDE POWER OUTPUT RELATIONSHIP: NON-DOMINANT VS. DOMINANT LIMB</u>
Authors	Haley L. Boccomino, SPT, Bilal T. Daoud, SPT, Alexandra Hudas, SPT, Whitley A. North, SPT, and Moh H. Malek, PhD
Abstract	<p>INTRODUCTION: Surface electromyography (EMG) is a non-invasive method of examining neuromuscular response during muscle action. Lack of consistency in previous studies may be, in part, due to the mode of exercise utilized and the methodology used to examine muscle activation. The log-transformed EMG amplitude power output relationship may be used to answer research questions related to neuromuscular fatigue. The purpose of this study was to identify differences in the muscle for the non-dominant and dominant limb using the log-transformed EMG amplitude power output relationship for incremental double-leg knee-extensor ergometry.</p> <p>OBJECTIVE: Findings from studies that examine bilateral differences between the non-dominant and dominant limb during whole-body (i.e., cycle ergometry) are equivocal. This may, in part, be due to the mode of exercise (i.e., whole-body) and how the data are analyzed. Surface electromyography (EMG) is a non-invasive method of examining motor unit recruitment and activation during exercise. The log-transformed electromyography amplitude power output relationship provides y intercept and slope terms on a subject by subject basis which can therefore be statistically analyzed. The purpose of this study, therefore, was to identify potential differences in the muscle for the non dominant and dominant limb using the log-transformed EMG amplitude power output relationship for continuous exercise that isolates the quadricep femoris muscles.</p> <p>METHODS: Nine healthy college-aged men aged 20 to 31 years old (mean \pm SEM: age, 22.6 ± 1.2 y) volunteered as subjects. Double leg knee extensor ergometry was performed to isolate the quadricep femoris muscle. At the beginning of the test, subjects warm up at 6 W for 2 mins and power output was increased 6 W every min until the subject was unable to maintain 80 revolutions per minute. EMG electrodes were placed on the rectus femoris muscle of both limbs. The slope and y-intercept derived from the log-transformed EMG-amplitude power output relationship was analyzed using paired samples t-tests.</p> <p>RESULTS: The slope and y-intercept were estimated on an individual basis between the non-dominant and dominant limb using the log-transformed model. The paired t-test revealed no significant mean differences between the two limbs.</p> <p>DISCUSSION: The relationship between the non-dominant and dominant limb indicated no significant mean differences for the y-intercept (a term) and slope (b term). However, the slope term value for each subject corresponded to the 95% confidence interval that did not cross one. Thus, for both limbs, the slope term value was significant for that subject.</p> <p>CONCLUSION: Results of the present study indicate that there are no differences in muscle activation between the non-dominant and dominant limbs for continuous muscle action.</p>

ABSTRACT H04	
Name	Ariana Brown
Category	Health Care Sciences
Title	<u>Knowledge Translation of Screening LBP Patients for Cognitive/Affective Tendencies</u>
Authors	Ariana Brown, SPT; Michael Feng, SPT; Marie Eve Pepin PT, DPT, MSPT, OMPT; Nora E. Fritz Ph.D., P.T., D.P.T., N.C.S.
Abstract	<p>INTRODUCTION: In Low Back Pain (LBP) patients, individuals with cognitive/affective tendencies experience greater pain, functional impairments, and risk of depression and prolonged disability. Therefore, early identification of these patients, through screening questionnaires (SQ), is important so treatments can address these tendencies. These recommendations are found in the APTA's Clinical Practice Guidelines (CPG) for LBP. However, gaps between evidence and clinical practice exist. Knowledge translation (KT) provides a framework to bridge this gap. The objectives of this research are to 1) determine current use of SQs for affective/cognitive tendencies by clinicians and 2) improve use through implementation of a KT framework.</p> <p>METHOD: Following conversations with the leadership of a large urban outpatient orthopedic clinic, the authors utilized the Knowledge-to-Action Cycle to guide this project. A preliminary chart audit was performed, and a survey was administered to clinicians that examined barriers and facilitators for SQ use. Next, the results of the audit and surveys were presented and clinicians were engaged in a focus group to work toward overcoming barriers and identifying solutions to increase appropriate SQ usage.</p> <p>RESULTS: 29 clinicians participated. The initial chart audit found 1 instance of SQ use. Common barriers included time and clinician's knowledge and confidence. Plans to increase usage of the identified SQs included training, creation of smart phrases for the electronic medical record, use of "cheat sheets" on clinician computer stands, and working with front desk staff to provide questionnaires at initial evaluation. Further modifications took place following an initial chart audit which showed a 3% increase in usage. Final chart audit and closing surveys are scheduled to be performed in the next month.</p> <p>CONCLUSION: SQ were not being used when evaluating patients with LBP in the physical therapy clinic surveyed. Barriers were successfully addressed and results of the final chart audit is pending.</p>

ABSTRACT H05	
Name	Alexis Campbell
Category	Health Care Sciences
Title	<u>Graduate Students' Perceptions of a Canine-Assisted Stress-Reduction Intervention</u>
Authors	Alexis Campbell, MOT, OTRL & Christine Kivlen, Ph.D., OTRL
Abstract	<p>Title: Graduate Students' Perceptions of a Canine-Assisted Stress-Reduction Intervention</p> <p>INTRODUCTION: Several on-campus canine-assisted stress-reduction programs are implemented to support undergraduate students (Binfet, 2017; Pendry & Vandagriff, 2019) with little research that has explored canine visitation with graduate students pursuing advanced degrees. This research explored the perceptions of 104 health sciences graduate students after participating in a six-week canine stress-reduction intervention.</p> <p>OBJECTIVES: This qualitative research aimed to understand the associated perceptions of graduate level students following their participation in a canine-assisted stress-reduction intervention.</p> <p>METHODS: Participants interacted with a volunteer dog-handler team in groups of 3-5 for 35-minute sessions once a week for six weeks. Upon intervention conclusion participants were asked several open-ended questions including: "Why did you participate in a canine-assisted stress-reduction study?" "In one word describe how you felt before and after sessions" and "What are three words that describe therapy dogs?"</p> <p>RESULTS: Content analysis of participant responses revealed the following themes: stress reduction to combat the pressures of graduate school (42%; e.g., "I wanted to do something outside of class that would be beneficial to me"), spending time with therapy dogs (35%; e.g., "I was excited to have the opportunity to interact with dogs and take a break of school because I grew up never having a dog"), and contributions to research (13%; e.g., "I've never been a part of someone's research before, and I found this particular study very interesting"). One-word descriptors were recorded for pre-post session. Frequency distribution revealed prevalent pre-visit descriptors including stress (66%), anxious (53%), tired (28%), and worried (13%) whereas post-visit descriptors included relaxed (70%), calm (46%) and happy (41%).</p> <p>CONCLUSIONS: Findings suggest parallels between the experiences of undergraduate and graduate students surrounding stress, therapy dog appeal, and the benefits of therapy dogs that contribute to one's well-being and overall quality of life.</p>

ABSTRACT H06	
Name	Erin Edwards
Category	Health Care Sciences
Title	<u>The Influence of Cognition on the Relation between Backward Walking and Falls in Multiple Sclerosis</u>
Authors	Erin Edwards, BS; Ana Daugherty, PhD; Nora Fritz, PhD PT DPT NCS
Abstract	<p>Introduction: Backward walking (BW) is a complex motor task that requires increased cognitive demands. In persons with multiple sclerosis (PwMS), our laboratory has demonstrated BW velocity as a marker of fall risk and cognitive correlate of processing speed and visuospatial memory. However, the extent to which the relation between BW and falls is dependent upon cognitive function is unknown.</p> <p>Objectives: Examine the discrete influences of processing speed and visuospatial memory on the relation between BW and falls in PwMS. Based on published data, we hypothesized that the relation between BW and falls is conditional upon processing speed and visuospatial memory.</p> <p>Methods: In a single session, spatiotemporal measures of forward walking (FW) and BW, processing speed [Symbol Digit Modalities Test (SDMT)], visuospatial memory [Brief-Visuospatial Memory Test-Revised (BVMT-R)] and retrospective falls were collected. Using hierarchical regression modeling, moderation was tested in a second step including an interaction term predicting falls. Co-variables for all analyses included age and disease severity.</p> <p>Results: Thirty-eight PwMS participated. BW, processing speed and co-variables significantly predicted the number of falls ($R^2 = 0.301$, $p = 0.016$), but processing speed did not change the relation to BW ($\hat{\beta}R^2 = 0.013$, $p > 0.1$). In a separate model, BW, visuospatial memory and co-variables significantly predicted the number of falls ($R^2 = 0.332$, $p = 0.008$), but visuospatial memory did not change the relation to BW ($\hat{\beta}R^2 = 0.001$, $p > 0.1$). FW models generated comparable results.</p> <p>Conclusion: There was no statistical evidence to suggest processing speed or visuospatial memory as moderators of the relation between BW and falls in our small sample of PwMS. Larger scale studies examining additional functional domains impacted by MS are needed to establish a neurobiological framework aimed at characterizing processes relevant to BW and support its clinical utility as a fall risk measure for PwMS.</p>

ABSTRACT H08	
Name	Jennie Feldpausch
Category	Health Care Sciences
Title	<u>THE EVOLUTION OF THE PHYSICAL WORK CAPACITY AT THE FATIGUE THRESHOLD TEST: PAST, PRESENT, AND FUTURE</u>
Authors	Jennie E. Feldpausch, SPT1,2, Amanda L. Blok, SPT1,2, Emily L. Frederick, SPT1,2, Jared W. Coburn, PhD3, and Moh H. Malek, PhD1,2
Abstract	<p>The assessment of neuromuscular fatigue using surface electromyography has evolved over the past 40 years while maintaining some of the original key features. In this mini-review paper the goal will be to briefly present a history and systems of the physical working capacity at the fatigue threshold (PWCFT). In addition, we will discuss studies that have investigated the effect of different interventions such as supplementation, exercise, and cognitive fatigue to examine what stimuli influence the PWCFT. The latter section of this mini-review will discuss future studies that may provide additional information related to the underlying physiological mechanism(s) that influence the PWCFT. We will conclude with the practical application of PWCFT in health and sports settings.</p>

ABSTRACT H09	
Name	Savanna Hughey
Category	Health Care Sciences
Title	<u>Quality of Life of Aging Caregivers of Adults with Disabilities: Results from a Family Support Project in Michigan</u>
Authors	Jennifer Gavia, B.S., MOT Student, Wayne State University Aevah Hebda, B.S., MOT Student, Wayne State University Savanna Hughey, B.S., MOT Student, Wayne State University Mary Kachocha, B.S., MOT Student, Wayne State University Morgan Munroe, B.S., MOT Student, Wayne State University Ala Sarsour, B.S., MOT Student, Wayne State University Alyssa Thanasiu, B.A., MOT Student, Wayne State University Preethy Sarah Samuel, OTRL, PhD. Associate Professor, Wayne State University
Abstract	<p>Introduction: In the U.S., of the estimated 3.6 million individuals with intellectual/ developmental disabilities (I/DD), 71% live with their family. More than half of these are over 40 years, and 24% are over 60 years. Aging caregivers have to deal with their own age-related health declines, while supporting their adult offspring with I/DD transitioning to adulthood, with limited home and community-based resources. Peer-mediated family support interventions can empower family caregivers to learn to navigate health-care and disability-service systems.</p> <p>Objectives: The purpose of this study was the evaluate if Michigan Older Caregivers of Emerging Adults with Autism and other Neurodevelopmental Disabilities (MI-OCEAN) could improve the quality of life (QOL) of aging family caregivers of adults with I/DD. MI-OCEAN was a manualized 6-month The family support project intervention delivered to 103 aging caregivers in Michigan by 14 peer mentors.</p> <p>Methods: The study used a quasi-experimental research design with pre-post evaluation of caregiver well-being. The brief version of the World Health Organization's Quality of Life scale (BREFQOL) was used to measure the caregiver's QOL in four domains (physical, psychological, social and environmental). Each of the 25 items in this scale was measured using a 5-point rating scale.</p> <p>Results: MI-OCEAN was found to be beneficial in improving the caregiver's QOL. Although the small increases in the total QOL or the domain level scores did not approach statistical significance, we found that three individual items (satisfaction with self, support from friends, and informational support) in the social, psychological, and environmental domains had significantly improved.</p> <p>Conclusion: Despite lifestyle changes due to the pandemic, caregivers who received peer-mediated family support to navigate complex systems of care reported better QOL. Findings from this study can inform rehabilitation professionals who are committed to improving the well-being of adults with I/DD and their families through multidisciplinary teams.</p>

ABSTRACT H11	
Name	Allison Lennig
Category	Health Care Sciences
Title	<u>Pilot Evaluation of the Computer-Based Assessment of Non-Cognitive Attributes of Health Care Professionals (CANA-HP)</u>
Authors	Christina Paul, Aubyn Herbison, Sam Whitaker, Allison Lennig; Research Advisors: Dr. Sara Maher and Dr. Regina Parnell
Abstract	<p>To diversify student admissions, holistic admissions tools have been considered. The purpose of this study was to establish instrument reliability, inter-rater reliability, validity, item discrimination, item difficulty, and bias of the Computerized Assessment of Non-Cognitive Attributes of Health Care Professionals (CANA-HP).</p> <p>METHODS: A cross-sectional design was used. Thirty-seven applicants into the occupational therapy program participated during admission interviews in 2020. Data consisted of a demographic information, and six criterion measures (science, non-science and undergraduate grade point average, and verbal, quantitative and analytical graduate record exam scores). The CANA-HP was developed in conjunction with content experts and student feedback, and consisted of six multiple choice and six open-ended questions related to health care roles.</p> <p>RESULTS Open-ended questions had adequate internal reliability, adequate item discrimination, and adequate difficulty. Multiple choice questions had low reliability and discrimination. No correlation between the CANA-HP and standardized cognitive assessments was found, except non-science GPA which was significantly correlated to the total open-ended scores and total overall score. The CANA-HP was not biased toward individuals from varied demographic backgrounds.</p> <p>DISCUSSION The use of open-ended questions is recommended for assessment of non-cognitive attributes of applicants into occupational therapy programs. Traditional multiple choice questions were not supported. Predictive validity of the tool is still needed.</p> <p>CONCLUSIONS Occupational therapists in educational settings could consider adding open-ended ethical questions to the application process when interviews are not feasible.</p>

ABSTRACT H12	
Name	Luke Gray
Category	Health Care Sciences
Title	<u>A COMPARATIVE STUDY OF NEUROMUSCULAR ELECTRICAL STIMULATION (NMES) TECHNIQUES FOR PRECLINICAL STUDIES</u>
Authors	Gray, L, Odeh, B, Ameye, M, Atwood, Z, Begam, M, Roche JA
Abstract	<p>INTRODUCTION: Neuromuscular electrical stimulation (NMES) increases donor-cell-derived muscle fiber formation. This study was necessary to characterize potential advantages and limitations of implantable NMES before future use. First, a gold standard external electrical stimulator was used to compare surface electrodes with subcutaneous electrodes to ascertain if subcutaneous electrodes limited maximum contractile torque. Second, a gold standard external electrical stimulator was compared with an implantable stimulator to ascertain if the implantable stimulator limited maximum contractile torque. We hypothesized that the type of electrodes or stimulator would not affect maximal contractile torque elicited by NMES in mice.</p> <p>METHODS: We studied six, healthy, male C57BL/6J mice, according to approved protocols. We elicited twitch and tetanic contractions in the tibialis anterior (TA) muscle and measured torque with an isokinetic dynamometry platform. We compared three types of electrodes: standard bipolar surface (SBS), custom bipolar surface (CBS), and subcutaneous. Next, we connected the subcutaneous electrodes to an implantable stimulator and compared torque elicited by the implantable stimulator with the external stimulator.</p> <p>RESULTS: The SBS, CBS, and subcutaneous electrodes connected to a gold standard external stimulator elicited maximal torques of 1.83 ± 0.29 Nmm, 1.79 ± 0.38 Nmm, and 1.92 ± 0.08 Nmm, respectively (no significant difference between groups detected by one-way ANOVA). This result indicates that the subcutaneous electrodes did not limit maximal contractile torque. Connecting the subcutaneous electrodes to the implantable stimulator and driving it with a maximum voltage of 4.5V elicited a maximal torque 0.80 ± 0.40 Nmm ($P=0.002$ when compared with external stimulator for the same set of subcutaneous electrodes (Mann-Whitney Rank Sum Test).</p> <p>DISCUSSION: Our results suggest that the type of stimulator affects maximal tetanic torque elicited by NMES. Specifically, our implantable stimulator will be able to produce submaximal, but not maximal contractions.</p> <p>CONCLUSIONS: Prior characterization of electrical stimulators and electrodes and their limitations may help inform and optimize research methods for future studies.</p>

ABSTRACT H13	
Name	Drew Mankowski
Category	Health Care Sciences
Title	<u>DOSAGE ADJUSTED RESISTED TRAINING (DART) DOES NOT INDUCE MUSCLE DAMAGE IN A MOUSE MODEL OF MUSCULAR DYSTROPHY</u>
Authors	Mankowski, Drew; Camaj, Robert; Murphy, Nicholas; Dr. Pepin, ME; Dr. Blackmer, M; Dr. Roche JA
Abstract	<p>INTRODUCTION: Prior unloaded concentric exercise has been shown to be protective against muscle damage in a mouse model of dysferlin-associated muscular dystrophy. Here we describe a study where we tested if loaded concentric exercise with a resistance of 50% 1-repetition-maximum (1RM) produces muscle damage in dysferlin-deficient mice.</p> <p>OBJECTIVES: To determine whether loaded, dosage adjusted concentric training limits the amount of muscle damage in a dysferlin deficient muscle. We hypothesized that concentric exercise with 50% 1RM will produce less damage than a similar set of eccentric contractions.</p> <p>METHODS: We studied six, dysferlin-deficient, male BLAJ mice, which were 1-yr old, according to approved protocols. Mice performed a single bout of forced concentric exercise (N=3) or forced eccentric exercise (N=3). Forced exercise was performed under general anesthesia induced and maintained by inhaled isoflurane. Muscular contractions were elicited by neuromuscular electrical stimulation. Three days after exercise, we euthanized mice and collected their exercised and unexercised hindlimb tibialis anterior muscles. We snap froze the muscles in liquid nitrogen, made 5um cross sections with a cryostat, stained the sections with hematoxylin and eosin, studied the sections by light microscopy, and quantified muscle damage based on number of muscle fibers showing cytoplasmic disruption.</p> <p>RESULTS: Only 1.5±0.6% fibers were damaged in the exercised muscle of the concentric group, whereas 33.4±10% fibers were damaged in the exercised muscle of the eccentric group.</p> <p>DISCUSSION: Our results suggest that dosage adjusted concentric exercise training with 50% 1RM can be performed by dysferlin-deficient mouse muscle without sustaining muscle damage. With follow up clinical trials, it may be possible to establish that similar exercise might help obtain the benefits of exercise without causing muscle damage in humans with dysferlin-associated muscular dystrophies.</p> <p>CONCLUSIONS: Active concentric contractions added to passive ranging exercise might benefit patients with various muscular dystrophies.</p>

ABSTRACT H14	
Name	Delaney McNeil
Category	Health Care Sciences
Title	<u>Feasibility of the Lower Extremity Fugl Meyer Assessment in Acute Stroke</u>
Authors	Delaney McNeil, SPT; Paige Senn, SPT; Leah Vrugink, SPT; Faculty Advisor: Dr Vicky Pardo PT, DHS
Abstract	<p>Introduction: The Fugl-Meyer Assessment Scale (FMA) is a standardized quantitative outcome measure that assesses motor function following a stroke. The lower extremity sub-scale (FMA-LE) was studied in chronic stroke and found to have good reliability and concurrent validity. The feasibility in an acute stroke population has not been studied to date. The purpose of this study was to determine feasibility, inter-rater reliability and discrepancies between raters in each section of the FMA-LE in individuals with acute stroke in an inpatient rehabilitation setting.</p> <p>Methods: Forty-three patients with acute stroke resulting in unilateral hemiparesis were recruited from an inpatient rehabilitation setting in Detroit. Participants were assessed using FMA-LE, twice on the same day with a 5-minute rest in between. Blood pressure, heart rate, oxygen saturation, rate of perceived exertion and pain were measured before, during the 5-minute rest, and after both trials. The intraclass coefficient (ICC 2,1) was computed to assess relative reliability of each test. Standard error of measurement (SEM) was calculated as standard deviation (SD)* $\sqrt{1-ICC}$. MDC at 95% confidence level (MDC95) was calculated as $z*SEM \sqrt{2}$ where $z=1.96$.</p> <p>Results: The mean time to complete each trial was 8.99 (SD 2.12) and 8.68 (SD 2.25) minutes. Mean FMA-LE was 22.97 (SD 8.36) out of a possible 34 points, with an ICC of 0.98 (SEM: 1.32, MDC95: 3.66). Scores between 20-25 and 15-19 were shown to have higher discrepancies compared to those who scored between 32-34 points or 0-9 points. FMA-LE section 3 produced the most discrepancies.</p> <p>Conclusions: The FMA-LE is ideal for in-person assessment and is a feasible and reliable measure of motor recovery in the acute stroke population. The study detected certain FMA-LE sections that may require additional training. Finally, it is not ideal for telehealth as it requires the clinician to physically assess a patient's motor recovery.</p>

ABSTRACT H15	
Name	Martinson Nyarko
Category	Health Care Sciences
Title	<u>THE EFFECTS OF ISOMETRIC TRAINING ON THE NUSTEP IN PATIENTS WITH CHRONIC STROKE</u>
Authors	Martinson Nyarko, SPT Richa Vakil, SPT Libin Vaidyan, SPT Vicky Pardo, PT, DHS
Abstract	<p>Introduction: The NuStep Transitt recumbent stepper is equipped with a tablet display that produces real-time feedback of performance during a lower extremity isometric paddle ball game. The purpose of this study was to determine the effect of isometric lower extremity training with visual feedback on individuals with chronic stroke.</p> <p>Methods: Twenty participants with chronic stroke participated in this study. Pre- and post-evaluations included data collection using the GAITRite, Lower Extremity Functional Scale (LEFS), Four-Square Step Test (FSST), Five Times Sit to Stand (5xSTS), 6-Minute Walk Test (6MWT), and the Fugl-Meyer lower extremity motor and sensory (FMA) portions. Intervention sessions consisted of 45 minutes of isometric training with visual feedback on the Nustep Transitt two times a week.</p> <p>Results: Fast gait showed significant changes for decreased time spent in double support on the non-hemi side ($p = 0.021$). Overall gait speed increased for both fast and normal gait speeds. Comparison of pre/post - intervention performance on outcome measures revealed: 10% of participants met the MDC for comfortable gait speed, 20-35% of participants met the MDC for fast gait speed, 60% of participants met the MDC for 5TSTS, 40% of participants met the MDC for the FSST, and 5-10% of participants met the MDC for FMA.</p> <p>Discussion: Decreased use of the hemiparetic limb, leading to inefficient gait is a common problem for individuals' post-stroke. Participation in the Nustep Transitt intervention required subjects to activate their hemiparetic leg more frequently and efficiently resulting in improved strength and coordination which may translate to safer transfers, improved quality of gait, improved functional mobility and a decrease in fall risk.</p> <p>Conclusion: This intervention study demonstrated that the addition of visual feedback using an interactive game during recumbent stepping had significant and clinically relevant effects on the strength, coordination, and functional mobility of individuals with chronic stroke.</p>

ABSTRACT H16	
Name	Haley Pereira
Category	Health Care Sciences
Title	Radical Nephrectomy for Unclassified Renal Cell Carcinoma with Pure Sarcomatoid Differentiation
Authors	Haley Pereira, MSc
Abstract	<p>Introduction Representing approximately 3% of cancers in the United States, renal cell carcinoma (RCC) is a prevalent malignancy seen in the urinary system. RCC is known for its array of classifications and histological subtypes, with sarcomatoid differentiation being an aggressive attribute. Sarcomatoid differentiation is not its own histological subtype, but is instead a key feature studied in its own regard due to its propensity to increase the risk of metastasis and decrease long-term survival outcomes.</p> <p>Objective To highlight the importance of the Pathologists' assistant's role in assessing gross presentations and the overall relation to patient diagnosis and treatment.</p> <p>Methods Presented here is a rare case of pT4NX undifferentiated RCC with pure, 100% sarcomatoid differentiation in a 62-year-old male patient. The lesion was identified incidentally from a computerized tomography (CT) scan of the chest. Following a radical nephrectomy of the left kidney, immunohistochemical testing was done to confirm the RCC classification and histological subtype.</p> <p>Results A 13.5 x 12.0 x 8.0 cm necrotic mass was located on the left kidney, involving both poles, with direct extension into the submucosa of the colon. Histologically, the mass was composed entirely of solid sheets of spindle cells. Immunohistochemical analysis showed positive epithelial and mesenchymal markers, confirming the kidney primary diagnosis with unclassified, pure sarcomatoid differentiation.</p> <p>Conclusion RCC classification determines prognosis and treatment options, and the pathologists' assistant aids in accurate determination by taking appropriate measurements and sections so that staging, grading, and margin assessment can be made both macroscopically and microscopically. RCC presents itself in many ways, and the thoroughness of the pathologists' assistant plays a key role in differentiating and diagnosing.</p>

ABSTRACT H17	
Name	Gianluca Scerri
Category	Health Care Sciences
Title	<u>Age-Related Differences Between Physical Measures and Cognition</u>
Authors	Brett Bartels, SPT; Tyler Bush, SPT; Jennifer Nguyen, SPT; Gianluca Scerri, SPT
Abstract	<p>INTRODUCTION: As individuals age, there is a recognized link between physical function and cognitive decline. Prior work from our lab has demonstrated that grip strength may be used as a marker for cognitive decline in older adults, and recent work shows that the relationship among grip strength and cognition is present even in middle-aged adults. The purpose of this study was to extend the findings of our prior work longitudinally, but investigating the relationship among grip strength, physical function, and cognitive function within young adults, within middle-aged adults, and between young and middle-aged adults between 2 visits, 1 year apart.</p> <p>METHODS: A longitudinal study between and within-group design was conducted to determine differences in cognitive and physical function between young and middle-aged adults as well as changes within groups. Young adults, 20-30 years old, and middle-aged adults, 45-65 years old performed the grip strength test and six-minute walk (6MWT) physical tests and the California Verbal Learning Test (CVLT), Symbol Digit Modalities Test (SDMT), Trail Making Tests, Controlled Oral Word Association Test (COWAT), and the Stroop cognitive tests at two visits (V1, V2) spaced 1 year apart. To determine differences between groups and visits, a repeated measure ANOVA and independent t-tests were used.</p> <p>RESULTS: (38 subjects, 16 Male, 22 Female) Young adults walked significantly further than middle-aged adults on the 6MWT ($p = .026$) but did not perform significantly different from middle-aged adults on grip strength at V2. Young adults demonstrated a small improvement in cognitive performance on the SDMT and Stroop at V2, while middle-aged adults only showed improvements on Trails A test at visit 2. Middle-aged adults demonstrated a decline in grip strength between V1 and V2 ($p = .003$), with no significant change in the young adult group. There was a significant relationship between the Stroop V1 score and V2 6MWT for the middle-aged group ($r = .688$; $p = .031$); however, there were no other significant relationship between grip strength or the 6MWT and the cognitive measures in either group.</p> <p>DISCUSSION: Young and middle-aged adults did not perform significantly different on measures of grip strength, but middle-aged adults demonstrated a significant decline in 6MWT performance over the course of a year. Further, performance on the Stroop test at V1 was related to 6MWT performance at V2 suggesting that cognitive measures may also predict physical decline, even in middle-aged adults.</p> <p>CONCLUSION: Findings from this study suggest middle-aged adults may start showing declines in physical function over the course of a year, while young adults presented with no changes. A larger sample size is needed to determine if physical and cognitive declines may start to begin during middle age.</p>

ABSTRACT H19	
Name	Jordan Spiller
Category	Health Care Sciences
Title	<u>Step Test Evaluation of Performance on Stairs (STEPS): Adaptations, Reliability, and Ease of Use for the Chronic Stroke Population</u>
Authors	Christina Hammond, SPT; Claire Sickon, SPT; Jordyn Shepler, SPT; & Jordan Spiller, SPT; Andrew Moul, PT, DPT, NCS; Nora Fritz PhD, PT, DPT, NCS & Victoria Pardo, PT, MHS, DHS
Abstract	<p>INTRODUCTION: After a stroke, individuals experience difficulties with postural alignment and functional tasks increasing the risk for falls. The STEPS tool was developed to assess stair navigation in persons with Huntington's disease, but the establishment of a reliable stair assessment is critically needed for persons post-stroke.</p> <p>OBJECTIVES: The purpose was to adapt the STEPS tool to be more specific to the chronic stroke population and determine the ease of use among clinicians.</p> <p>METHODS: The study design was descriptive and conducted virtually via Zoom. Thirteen participants were recruited, and two separate sessions were conducted. Each session entailed rating five videos (2 training and 3 patient videos) using the STEPS tool. Discussions were facilitated during the training videos and a focus group was held after the final grading. Adaptations were made to the STEPS tool after each session. The data was analyzed using descriptive statistics due to the small sample size.</p> <p>RESULTS: As a result of the discussions and focus groups, modifications were made to the STEPS tool to make it more specific to the chronic stroke population and increase the tool's usability. The variability in raters' scores decreased after training and discussion of the tool. The range of scores decreased from 2.0 for the three practice videos to 0.20 for the three patient videos, demonstrating the effectiveness of training on using the STEPS tool.</p> <p>CONCLUSION: The study showed that the STEPS tool has the potential to be a reliable outcome measure to assess stair navigation in the chronic stroke population. Future research should explore the validity and reliability of the tool and its ability to be used in a clinical setting. Future studies should establish a relationship between a score on the STEPS tool and fall risk.</p>

Pharmaceutical Sciences Graduate Programs

ABSTRACT NO. PSC01	
Name	Lana Alghanem
Category	Pharm Sci
Title	<u>Effect of Pioglitazone on PP2A Activity in Primary Human Skeletal Muscle Cells</u>
Authors	Lana Alghanem, PharmD; Berhane Seyoum, MD, Zaher Msallaty MD, Abdullah Mallisho MD, Xiangmin Zhang, Ph.D. and Zhengping Yi, Ph.D.
Abstract	<p>Introduction: Skeletal muscle insulin resistance is one of the main contributors to Type 2 Diabetes (T2D). T2D is being treated with various medications, including Pioglitazone, a PPAR-γ agonist and a potent insulin sensitizer for skeletal muscle. To date, the molecular actions of Pioglitazone that sensitizes skeletal muscle to insulin is incompletely understood. Recently, our group has reported the activation of Protein phosphatase 2A (PP2A) in primary human skeletal muscle cells by metformin, a widely prescribed anti-diabetic drug. PP2A is a major serine/threonine phosphatase modulating various signaling pathways such as insulin signaling. Whether PP2A plays a role in pioglitazone-induced insulin sensitivity improvement in human skeletal muscle cells is currently unknown.</p> <p>Objectives: To investigate whether Pioglitazone can activate PP2A in primary human skeletal muscle cells.</p> <p>Methods: Skeletal muscle cells derived from 4 lean insulin-sensitive (Lean) and 4 obese-insulin resistant (OIR) participants were cultured and differentiated into myotubes and treated with 2 μM Pioglitazone for 24 hours and 100nM insulin for 15 min before harvesting. PP2Ac activity was measured by a phosphatase activity assay kit.</p> <p>Results: There is no difference in PP2A activity between myotubes derived from Lean or OIR, and insulin had no effect on PP2A activity in these myotubes. However, Pioglitazone significantly increased the activity of PP2A in the myotubes for obese insulin-resistant participants (n=4, p p < 0.05), but did not change PP2A activity for Lean participants. One main limitation of the study is the relatively small sample size, and additional participants will be needed to confirm these results.</p> <p>Conclusion: This study provides first evidence that Pioglitazone may increase the activity of PP2A in the myotubes derived from OIR but not Lean participants. These findings provide potential new targets to study insulin resistance in humans.</p>

ABSTRACT NO. PSC02	
Name	Bandar Almutairy
Category	Pharm Sci
Title	Arsenic (As ³⁺) inhibited pSTAT3(Y705) and induced SHP-1 in Human Bronchial Epithelial Cells
Authors	Bandar Almutairy, Yao Fu, Zhuoyue Bi, Wenxuan Zhang, Priya Wadgaonkar, Yiran Qiu, Chitra Thakur, Fei Chen.
Abstract	<p>Introduction: Arsenic has been classified as a carcinogenic agent and causes different types of cancers including lung cancer. The mechanisms of arsenic in inducing cancers remain to be fully elucidated. STAT3 is a cytoplasmic transcription factor that belongs to the seven members of the STAT proteins family that have been shown elevated in > 70% of human cancer. STAT3 has been reported to be constitutively active on various cancer types. STAT3 is activated by different pathways such as JAK1/JAK2 signaling pathways. SHP-1 is one of the phosphatases that has been shown to dephosphorylate p-STAT3(Y705).</p> <p>In the current study, we demonstrate the effect of arsenic on pSTAT3(Y705) dephosphorylation in human bronchial epithelial cells (Beas-2B cells).</p> <p>Objective: The goal of this study is to provide evidence demonstrating the effect of high concentration of arsenic on STAT3 tyrosine phosphorylation pSTAT3(Y705) and STAT3 Serine phosphorylation pSTAT3(S727) in human bronchial epithelial cells.</p> <p>Methods: In this study Beas-2B cells were treated with various concentration of arsenic As³⁺ (0, 5,10,20,40,80 μM) for 6 hrs. Then Western blot was performed to check the expression of the proteins of pSTAT3(S727), p-STAT3(Y705), and SHP-1.</p> <p>Results: our previous studies showed that arsenic-induced pSTAT3(S727) via JNK activation. Interestingly, our data showed that a high dose of arsenic significantly inhibited STAT3 tyrosine phosphorylation pSTAT3(Y705) in the dose and time-dependent manner and induced SHP-1 expression.</p> <p>Conclusion: Our data revealed that arsenic inhibited STAT3 tyrosine phosphorylation pSTAT3(Y705) most likely via induction of SHP-1.</p>

ABSTRACT NO. PSC03	
Name	Salma Althobaiti
Category	Pharm Sci
Title	<u>Synthesis and Characterization of Targeted Nanotherapy for Maximizing Immune Response in PDAC</u>
Authors	Salma Al-Thobaiti, MS Candidate; Postdoc Somrita Dey, PhD; Assistant Professor; Samaresh Sau, PhD; and Arun K. Iyer*, PhD, Associate Professor
Abstract	<p>Introduction: Pancreatic ductal adenocarcinoma (PDAC) is the most common primary malignant neoplasm of the pancreas as it accounts for more than 90% of all pancreatic cancer types. PDAC is an aggressive solid tumour and hard to treat. Moreover, PDAC is a typical cold tumor and characterized with less immune cells infiltration, so our research aims for developing a targeted delivery system for improving the infiltration of immune cells to PDAC TME.</p> <p>Objectives: Our objective is to develop pH sensitive CD40 antibody agonist loaded nanoparticles (CD40a-NPs) that can (i) target the tumor tissues and release the preloaded CD40 a within the PDAC tumor microenvironment (TME); (ii) activate the antigen presenting cells (APCs), especially the dendritic cells (DCs), thereby stimulating cytotoxic CD8+T cells for targeted killing of PDAC tumor cells. This NP approach will help overcome the toxicity associated with CD40a to non-target organ and tissue and facilitate selective tumor delivery thereby producing durable cancer therapy response in PDAC.</p> <p>Methods: We have used a thin lipid film lipid hydration method to formulate drug-loaded CD40a-liposomal NPs followed by extrusion to achieve the desired nano particle size. Dynamic light scattering (DLS) and Transmission electron microscopy (TEM) were used to characterization of NPs size and morphology. BCA kit was used to measure the CD40a loading capacity in NP. Subsequently, the cell uptake and fluorescence imaging study using NPs was performed by loading the NPs with FITC dye to confirm the adhesion of targeting CD40a-NPs to CD40 receptor on the surface of macrophage cells. MTT assays were performed to assess the safety of NPs.</p> <p>Results: The TEM analysis showed well-defined spherical unilamellar vesicles (CD40a-NPs) with a small size of ~154-166 nm that allows tumor targeting by the EPR effect. Furthermore, the choice of lipids in the formulation revealed better NP adhesion to tumor cells at acidic pH in comparison to physiological pH. Confocal microscopy data demonstrated the ability of targeted CD40a-NPs to release the CD4a in extracellular microenvironment that will facilitate the access of CD40a to CD40 transmembrane receptor. In addition, testing of our NPs revealed no apparent toxicity to the cells.</p> <p>Conclusion: Our approach of ECM pH responsive NP can open new avenue for selectively activating tumor-killing immune cells with minimum side effect. Our NP platform can also be used for delivery of other toxic antibodies selectively to the TME.</p>

ABSTRACT NO. PSC04	
Name	Dima Awad
Category	Pharm Sci
Title	<u>Mixture toxicology: Application of Concentration Addition Model to Water Contaminants</u>
Authors	Dima Awad, Zoha Siddiqua, Brook Penny, Paul Dobry, David Pitts, Phd.
Abstract	<p>Exposure of the human population to potentially toxic chemicals in the environment is common. An extensive literature exists that addresses the toxicity of individual chemicals of concern. Policies and laws typically focus on the toxicity of individual chemicals released into the environment. However, exposure to low levels of multiple chemicals is relatively common in industrialized societies. When considering exposure over a lifetime, investigators often refer to the exposome or exposomics. The impact of environmental chemical contamination includes not only human health, but also potential degradation of affected ecosystems and can affect ecosystem services (e.g., food, drinking water).</p> <p>The laboratory focuses on two categories of chemicals where exposure to mixtures is common. There are contaminants of emerging concern (CECs) found in surface and ground water that include pharmaceuticals, pesticides, flame retardants, and personal care products. There are also volatile organic compounds (VOCs) such as petroleum products which are common air contaminants and can also travel in ground water and enter buildings through vapor intrusion. The laboratory has created novel assay systems based on aquatic animals to investigate the toxicity of CECs and VOCs, and has evaluated the toxicity of individual chemicals.</p> <p>The objective is to develop methodology focused on mixture toxicology which can address gaps in our knowledge. Two mathematical models will be used to evaluate the toxicity of chemical mixtures created in the laboratory: the Concentration Addition (CA) model and the Independent Action (IA) model. The aquatic invertebrate, <i>Daphnia</i>, will be exposed to specific chemical mixtures and swimming behavior will be quantified using a digital camera. The bench mark concentration for a 10% response will be used as a measure of the “point of departure” and the BMC10 values will be used in the CA and IA models to determine if there is evidence for non-additive interactions between mixture constituents.</p>

ABSTRACT NO. PSC05	
Name	Ayatakshi Barari
Category	Pharm Sci
Title	<u>BIOMARKER TARGETED NANOPARTICLE COMBINATION THERAPY FOR RENAL CELL CARCINOMA.</u>
Authors	Ayatakshi Barari, Masters' Candidate; Duy Luong; Samaresh Sau, PhD, Research Assistant Professor; and Arun K. Iyer*, PhD, Associate Professor Department of Pharmaceutical Sciences, Eugene Applebaum College of Pharmacy and Health Sciences, Wayne State University, Detroit, MI
Abstract	<p>Introduction - Renal cell carcinoma (RCC) is a genitourinary cancer with high mortality and steadily rising incidence rate. RCC is a highly aggressive kidney tumor subtype, often showing resistance to conventional chemotherapy and radiotherapy. Development of drug resistance in RCC is attributed to many factors, such as active efflux pumps, genetic background, tumor hypoxic, altered cellular metabolism, and apoptosis impairment. Current treatment options include receptor tyrosine kinase inhibitors like cabozantinib (CB), mTOR inhibitors like everolimus, and hypoxia inducible factors 1 & 2 inhibitors like Belzutifan (BEL).</p> <p>Objective - The goal of this project is to screen effective combination therapy using Wayne State University developed apoptosis inducer CFM 4.16, with clinically used drugs - CB or BEL that inhibits the divergent tumor survival pathways and synergistically kills RCC better than monotherapy. Subsequently encapsulating drug combination in RCC biomarker-selective nanoparticle to improve in vivo outcome and RCC selectivity. Folic acid (FA) for targeting folate receptor beta (FRβ) and acetazolamide (ATZ) for targeting CA9 receptor of tumor hypoxia were selected as biomarkers.</p> <p>Methods - MTT-based cytotoxic assay was performed to find synergistic drug combination. Western blot analysis was performed to study downregulation of tumorigenic protein and upregulation of pro-apoptosis protein. Styrene maleic anhydride (SMA) - polymer based nanoparticles were synthesized through conjugation of SMA-DBCO polymer with azide (-N₃) functionalized FA-ATZ targeting ligand by copper free click chemistry.</p> <p>Results - Our studies showed both CFM4.16+CB and CFM4.16+BEL combinations have significantly higher RCC cell killing effect than monotherapy. The western blot analysis demonstrated both combinations can effectively downregulate tumorigenic pMET kinase than control and activate tumoricidal factors, like PTEN.</p> <p>Conclusion - To conclude, our logical drug combination approach has significant potential to effectively kill RCC and downregulate crucial tumorigenic proteins. Further, development of RCC biomarker selective nanoparticle has potential to overcome macrophage and hypoxia mediated drug resistance.</p>

ABSTRACT NO. PSC06	
Name	Courtney Campbell
Category	Pharm Sci
Title	<u>Elucidating the Role of the ISCU Scaffold Protein during [2Fe-2S] Cluster Formation in Cardiomyocytes and in vitro</u>
Authors	Courtney J. Campbell, Ashley E. Pall, Kalyan Kondapalli, Timothy L. Stemmler
Abstract	<p>Introduction: Iron-Sulfur (Fe-S) cluster-containing proteins are utilized in virtually every organism. Clusters are synthesized in humans predominantly by the mitochondrial ISC Pathway. This pathway is accomplished by the coordinated activity of six known proteins that assemble as a dimer of hexamers. ISCU2 (ISCU) acts as the scaffold protein on which [2Fe-2S] clusters are assembled. When Fe-S cluster production is compromised, the result is iron-loaded induced cardiomyopathy and unregulated caustic chemistry, leading to diseases resulting from iron overload and lack of essential Fe-S clusters. Friedreich's ataxia and ISCU Myopathy are two such diseases, the latter's root cause being a C-terminal truncation of ISCU.</p> <p>Objectives: The long-range goal of the Stemmler lab is to clarify the molecular details of ISC assembly machinery operation. Here we characterize the activity of ISCU during Fe-S cluster production, including its role in formation of ISC proteins, iron loading, and iron utilization.</p> <p>Methods: We use a variety of spectroscopic in vitro methods to first study the effects of ISCU truncation on Fe-S cluster production before moving into H9C2 cardiomyocytes to study the physiological effect of the lack of Fe-S clusters through this pathway brought about by ISCU mutation.</p> <p>Results: Previous data on the yeast ISCU ortholog (Isu1) show no change in Fe-binding affinity, Fe-binding environment or secondary structure with C-terminal truncation, although Fe-S cluster production was eliminated. The thermal stability of apo-Isu1 was changed upon C-terminal truncation. In cellular studies, native ISCU was knocked down and subsequently rescued using transfection with human ISCU.</p> <p>Conclusions: Our in vitro studies suggest that this ISCU region may be important for protein-protein interactions. The cellular work gives a working model to test the impact of site-directed mutations on human ISCU directly in cardiomyocytes, and to further elucidate the physiological role of the scaffold protein's interactions with the ISC complex in vivo.</p>

ABSTRACT NO. PSC07	
Name	Suhadinie Gamage
Category	Pharm Sci
Title	<u>Novel Regulatory Roles for CARD9 in Pancreatic Beta Cell Function and Dysfunction</u>
Authors	Suhadinie Gamage, MBBS,MS; Mirabela Hali, MS, Anjaneyulu Kowluru, PhD.
Abstract	<p>Introduction Short-term (acute) exposure of pancreatic islet beta cells to elevated glucose concentrations leads to insulin secretion (GSIS). In contrast, long-term (chronic) exposure of pancreatic islet beta cells to hyperglycemic conditions results in dysfunction and eventual demise of the effete beta cell. Available evidence implicates significant contributory roles for the activation of Rac1, a small G- protein, in GSIS and in cell dysregulation under chronic exposure conditions. Recent data implicate caspase recruitment domain containing protein 9 (CARD9), a scaffolding protein, in pathogenesis of metabolic diseases, including obesity and insulin resistance.</p> <p>Objectives The current set of investigations were aimed at assessing roles of CARD9 in GSIS and in metabolic dysregulation (i.e., stress kinase activation) of the pancreatic islet beta cell under high glucose exposure conditions.</p> <p>Methods Western blotting was used to demonstrate protein expression. CARD9 expression was suppressed using siRNA-CARD9. Insulin secretion was quantified by enzyme-linked immunosorbent assay. The degree of activation of Rac1 was determined by pull-down assay. Activation of p38MAPK, a stress kinase, was assessed by western blotting and densitometry.</p> <p>Results CARD9 is expressed in INS1- 832/13 cells, mouse islets, rat islets and human islets. Transfection of INS-1 832/13 cells with siRNA-CARD9 significantly suppressed GSIS in a Rac1-independent, but p38MAPK-dependent mechanism(s). In contrast, transfection of siRNA-CARD9 in these cells resulted in significant reduction in high glucose induced (24 hours; 20 mM) activation of Rac1-p38MAPK signaling module.</p> <p>Conclusions Based on these findings, we conclude that CARD9-p38MAPK module regulates physiological insulin secretion, and that CARD9-Rac1-p38MAPK signaling axis is accelerated under chronic hyperglycemic conditions.</p>

ABSTRACT NO. PSC08	
Name	Noah Gleason
Category	Pharm Sci
Title	<u>Regulatory Functions of Rho Guanine Dissociation Inhibitors in Pancreatic Beta Cells</u>
Authors	Noah Gleason, M.S.; Anjaneyulu Kowluru, PhD
Abstract	<p>Global cases of diabetes have abruptly increased from 108 million in 1980 to a staggering 422 million in 2014, with 2019 figures from the World Health Organization reporting just under 2 million annual deaths as a direct result of diabetes. It is well known that diabetes is the result of defective insulin secretion in pancreatic beta cells, however we are no closer to a definitive cure than 100 years ago since the discovery of insulin. Small G Proteins have been implicated in insulin secretion for quite some time, but with them come a myriad of regulatory partners delivering both promoting and inhibitor effects. Rho Guanine Dissociation Inhibitors (RhoGDI) are one such interacting partner. Composed of three proteins (RhoGDIα, β, γ), this family has been shown to predominantly perform a G protein inhibitory role, but recent studies have suggested additional regulatory roles in cytosol-membrane shuttling of G proteins. We aimed to ascertain the cellular localization of RhoGDIs during metabolic stress (glucotoxicity) in INS-1 832/13 cells. By utilizing specialized protocols to separate cytosolic and membrane, and non-nuclear and nuclear compartments from beta cells, we were able to accurately identify subcellular distribution of RhoGDIs under the duress of glucotoxicity. Interestingly, our results demonstrate that all three RhoGDIs are present in the cytosolic and the membrane bound fractions, therefore bringing credence to a membrane shuttling function. Our data also depicted the presence of RhoGDIα and RhoGDIβ existing in both nuclear and non-nuclear fractions while RhoGDIγ localized solely in the non-nuclear compartment under normal and glucotoxic conditions. These findings have provided valuable functional knowledge of RhoGDIs in pancreatic beta cell under basal as well as glucotoxic conditions to an understudied protein family.</p>

ABSTRACT NO. PSC09	
Name	Jeremy Kelm
Category	Pharm Sci
Title	<u>Replication Protein A Targeted PROTACs for the Treatment of Lung & Ovarian Cancer</u>
Authors	Jeremy M. Kelm, Sara Serafimovski, Hussein W. Kansou, Pamela VanderVere-Carozza, John J. Turchi, and Navnath S. Gavande.
	Presented by Sara Serafimovski & Hussein W. Kansou.
Abstract	<p>Despite remarkable advances within the field of molecular cancer therapeutics over the preceding decades, DNA-damaging drugs retain a central role in the pharmacotherapy of neoplastic diseases. The clinical response to DNA-damaging therapies is varied within and across cancer subtypes where a robust DNA damage response (DDR) predicts recalcitrance. Replication protein A (RPA) is a validated pharmacological target whose function includes activation of the nucleotide excision repair pathway after recognition and verification of DNA damage. RPA also plays an important role in DNA damage checkpoint activation. Proteolysis targeting chimera (PROTAC) based drug design presages a paradigm shift within drug discovery as PROTACs begin to carve out a space in the clinical landscape. The PROTAC platform is particularly suited for drugging overexpressed proteins such as RPA because iterative target degradation improves drug:target stoichiometry and precludes RPA's role in protein scaffolding. Herein, we describe the synthesis and biological evaluation of an RPA targeted PROTAC library conceived by conjugation of the diaryl pyrazole RPA inhibitor TDRL-551 and an E3-ligand via a linker of variable length and composition. Residing within the beyond rule of five (bRo5) chemical space, careful consideration was given to minimize the liability to cell permeability imposed by the high molecular weight of PROTACs. Excitingly, cellular uptake across the compound library was broadly improved relative to the unconjugated warhead TDRL-551. Similarly, RPA engagement by the PROTAC series was widely unhindered and, in many cases, improved relative to the warhead TDRL-551. A subset of the compound library unified by non-polar, rigid linker attachment of the E3-ligand (typified by GL-3315) display low single-digit micromolar IC50 values in viability assays across H460, A549, and A2780 cell lines. Preliminary results suggest that GL-3315 induces rapid ubiquitination of RPA at nanomolar concentrations. Future work will include characterization of DMax and DC50 for this RPA targeted PROTAC series.</p>

ABSTRACT NO. PSC11	
Name	Hainan Li
Category	Pharm Sci
Title	<u>G Protein-coupled Receptor 35 suppression prevents deoxycorticosterone acetate (DOCA)-salt-induced blood pressure elevation by protecting vascular endothelial cell functions</u>
Authors	Hainan Li, MS, Huong Nguyen, Ph.D, Sai Pranathi Meda Venkata, MS, Jie-Mei Wang, MD, PhD.
Abstract	<p>Introduction: G protein-coupled receptor 35 (GPR35) is a poorly characterized receptor with controversial endogenous ligands and unclear intracellular signaling pathways. Recent studies have suggested a potential association between GPR35 and hypertension. We hypothesized that deletion of GPR35 protects blood pressure (BP) through augmenting endothelial cell function.</p> <p>Objectives: In this study, we tested the hypothesis that the deletion of GPR35 plays a protective role in vascular endothelial cell functions. We further explored the possible pathways through which the loss of GPR35 regulates vascular tone and BP levels.</p> <p>Methods and Results: Human aortic endothelial cells (HAECs) were cultured in vitro. HAECs with knockdown of GPR35 showed improved cell functions including angiogenesis (3D tube formation) and migration (Boyden Chamber assay), enhanced tetrahydrobiopterin (BH4) (BH4 ELISA) and NO levels (DAF-FM DA staining), and decreased level of O₂•⁻ formation (DHE Staining). HAECs with knockdown of GCH1 showed impaired cell functions, which were ameliorated by GPR35 deficiency. Mouse aortic endothelial cells (MAECs) isolated from adult male GPR35 global knockout (GPR35KO) mice and their wild type control (GPR35WT) litters were cultured. GPR35KO MAECs showed improved cell functions compared with GPR35WT MAECs, with enhanced eNOS protein expression and its phosphorylated form (p-eNOS), as well as GCH1 protein expression. In the in vivo study, GPR35KO mice had 18 mmHg of decrease in mean blood pressure (MBP) compared to GPR35WT mice (Tail-cuff method). Acetylcholine (Ach)-induced endothelium-dependent vasodilation in aortas from GPR35KO was significantly enhanced compared with GPR35WT mice (vasorelaxation assay). In a deoxycorticosterone acetate (DOCA)-salt induced low-renin hypertensive mouse model, GPR35 deletion lowered MBP by 11 mmHg. The O₂•⁻ level in aortas from DOCA-salt-operated GPR35KO mice was similar to that in the sham-operated GPR35KO mice, and much lower than that in the DOCA-salt-operated GPR35WT mice.</p> <p>Conclusion: Our data suggest that the deletion of GPR35 can prevent BP elevation induced by DOCA-Salt model in mice by improving endothelial cell function through higher eNOS expression and its activated phosphorylated form in endothelial cells. This is attributed to the enhancement of GCH1-mediated BH4 synthesis. Our data suggested that the genetic deletion of GPR35 improved endothelium-dependent vasodilation, contributing to the low BP in GPR35KO mice.</p>

ABSTRACT NO. PSC12	
Name	Sai Pranathi Meda Venkata
Category	Pharm Sci
Title	<u>Deletion of G Protein-coupled Receptor 39 Protects Angiogenesis in Hyperglycemia</u>
Authors	Sai Pranathi Meda Venkata, Hainan Li, Huong Nguyen, Jia Yi Koh, Jie-mei Wang
Abstract	<p>Introduction: Endothelial cells (ECs) are essential to vascular homeostasis and angiogenesis. Endothelial dysfunction significantly contributes to critical limb ischemia in patients with diabetes. G protein-coupled receptor (GPR) 39 is an orphan receptor whose role in EC functions is unknown. We hypothesize that inhibition of GPR 39 protects angiogenesis under hyperglycemic conditions.</p> <p>Objectives: Evaluating the role of GPR39 in the regulation of angiogenesis in vitro and determining the therapeutic value of GPR39 inhibition in ischemia-induced angiogenesis in vivo.</p> <p>Methods and Results: Healthy human aortic endothelial cells (H-HAECs) and diabetic human aortic endothelial cells (D-HAECs) were cultured in vitro. The migration (Modified Boyden Chamber assay) and tube formation capacity of H-HAECs were impaired by the transfection of adenovirus carrying human GPR39 or by a GPR39 agonist, TC-G-1008. Conversely, GPR39 siRNA improved D-HAEC migration. In an angiogenesis protein profiler array, GPR39 overexpression has significantly reduced vascular endothelial growth factor, Interleukin-8, monocyte chemoattractant protein-1, and Angiopoietin-2 H-HAECs (n=5 per group, p, p<0.05). Adult male GPR39 global knockout (GPR39^{KO}) mice and age- and sex-matched wild-type (GPR39^{WT}) litters were rendered diet-induced obese (DIO) by a 10-week high-fat and an add-on 8-week hyperglycemia by low-dose streptozotocin (STZ) injections chow as they reflect the human condition where obesity is closely linked to type 2 diabetes development. Hind limb ischemia was created by left femoral artery ligation. Laser Doppler imaging showed that GPR39^{KO} mice had a faster blood perfusion recovery from ischemia than GPR39^{WT} mice. In adult male C57BL/6 with DIO-STZ, intramuscular injection of EC-affinitive AAV-mediated shRNA against GPR39 significantly accelerated blood perfusion recovery and prevented tissue necrosis compared to empty AAV treatment (n=5 per group, p<0.05).</p> <p>Conclusion: Our data indicated that genetic inhibition of GPR39 improved EC functions and accelerated angiogenesis from ischemia. We believe that the investigations in endothelial GPR39 may help better identify the novel therapeutic potential of targeting GPR39 in treating vascular complications in hyperglycemia.</p>

Clinical Doctorate in Pharmacy

ABSTRACT PPR01	
Name	Haifaa Abdallah
Category	Clinical Doctorate in Pharmacy
Title	<u>A Process Improvement Measure to Overcome Therapeutic Inertia at an Underserved Primary Care Clinic</u>
Authors	Haifaa Abdallah; Miranda Barkho; Linda Jaber, Pharm.D; Helen Berlie, BHS, Pharm.D.
Abstract	<p>Introduction: Therapeutic inertia (TI), defined as to initiate and or intensify treatment therapy, is a common phenomenon among patients with diabetes. National trends demonstrate an increase in the number of patients with suboptimal glycemic control despite the growing number of available anti-hyperglycemic agents. Methods for overcoming TI include identifying patients at risk, examining their characteristics, scheduling diabetes-only visits, and prescribing guideline directed therapy.â€</p> <p>Objectives: Identify patients at risk for TI and explore trends in patients' characteristics that will enable providers to project patients vulnerable to develop TI.</p> <p>Methods: This was a process improvement measure, implemented to identify TI in patients with diabetes seen at Health Centers Detroit Medical Group (HCDMG). Data was collected from HCDMG's electronic health records (EHR). A report was generated for patients with a diagnosis of diabetes seen between January 2019 and May 2021. Patients that were not at goal (>9% HbA1c) and were not seen by the pharmacist managed diabetes clinic (PDMC) were included. Data collected included baseline characteristics, presence of comorbidities, and use of anti-hyperglycemic agents. Descriptive analysis was performed and included age, sex, insulin users vs. non-insulin users, and number of hypoglycemic agents.</p> <p>Results: A total of 761 charts were reviewed and 160 were included in the analysis. Majority of patients were African American with a mean age of 57 years (SD + 10.06) and HbA1C of 11.1% (SD + 1.48). Most patients with TI were < 65 years of age (76%) and females (56%). Approximately 40% of patients were either not treated at all, or were only on 1 antihyperglycemic agent.</p> <p>Conclusion: To overcome TI, the 160 patients identified will be contacted to schedule a visit with the PMDC. Suboptimal therapy for A1c values above 9% was observed, highlighting the lack of guideline directed therapy for diabetes in a primary care setting.</p>

ABSTRACT PPR02	
Name	Prasannaraddi Alavandi
Category	Clinical Doctorate in Pharmacy
Title	<u>Effect of Intravenous Hydralazine on Short-Term Blood Pressure Variability in Non-Critically Ill Hospitalized Patients</u>
Authors	Prasannaraddi Alavandi, PharmD Candidate 2022; Zoina Andoni, PharmD Candidate 2022; Richard Zoltowski, PharmD Candidate 2023; Mutaz Juma, PharmD Candidate 2023; Christopher Giuliano, PharmD, MPH, Melissa Lipari, PharmD, BCACP
Abstract	<p>Introduction: Increases in blood pressure with high short-term blood pressure variability increases the risk of cardiovascular morbidity and mortality. We have observed significant blood pressure variability (BPV) in non-critically ill hospitalized patients with transiently elevated blood pressures receiving IV hydralazine at our center, however we do not understand which patient specific factors influence variations in response.</p> <p>Objectives: To develop a model to predict variation in blood pressure response as defined by both coefficient of variation (CV) and average real variability (ARV) for 6 and 12 hours after administration of IV hydralazine as well as to observe the percentage of patients who experienced an adverse effect from IV hydralazine.</p> <p>Methods: In this retrospective observational study we will evaluate non-critically ill patients 18 years or older at Ascension St. John Hospital and Ascension Macomb-Oakland Hospital admitted between January 2012 and March 2020 that had baseline blood pressure data 6 hours prior to administration of IV hydralazine and at least 3 blood pressure readings 12 hours post-administration. The primary outcome is the mean BPV at 6 and 12 hours post IV hydralazine administration measured as ARV and CV. Multiple linear regression will be done using ARV and CV as the dependent variables. Differences between patient responses to hydralazine will be assessed with the ANOVA test for continuous data.</p> <p>Results: Results are pending</p> <p>Conclusion: Results are pending</p>

ABSTRACT PPR03	
Name	Alisar Aljundi
Category	Pharmacy Practice
Title	<u>Retrospective Evaluation of the Effect of Oral N-Acetylcysteine on INR During Acetaminophen Overdose</u>
Authors	Varun Vohra, PharmD, DABAT; Alisar Aljundi; Hala Hassan Tokko; Ryan Herc; Jewell Konja; Ali Khanafer; Sarah Bauer, PhD; Victoria Tutag Lehr, BPharm, PharmD
Abstract	<p>Introduction: N-Acetylcysteine (NAC) is a safe and effective antidote for the management of acetaminophen toxicity and reduces the risk of hepatocellular damage. Literature suggests intravenous (IV) NAC administration is associated with transient elevations in international normalized ratio (INR). To our knowledge, no reports describe an association between administration of oral NAC and changes in INR. Clinically, INR is used as a marker of patient response to NAC and informs the decision to discontinue antidotal treatment. Evidence regarding the effect of oral NAC on INR may mitigate protracted treatment courses of NAC and thereby decrease hospital resource utilization and patient length-of-stay.</p> <p>Objectives: To retrospectively evaluate the effect of oral NAC on INR in cases of single entity acetaminophen overdose.</p> <p>Methods: Database query of single entity acetaminophen overdose cases reported to the Michigan Poison & Drug Information Center from January 1, 2016 through December 31, 2020. Data abstracted included demographics, oral NAC dosage, acetaminophen concentration, INR, aspartate and alanine transaminase values, co-morbidities, hospital length-of-stay, and medical outcome. Cases involving IV NAC administration, hepatic failure, hepatic transplant, concomitant use of medications/supplements known to increase INR, and/or pre-existing coagulopathies were excluded. Generalized linear mixed models estimated the association between oral NAC and INR.</p> <p>Results: There were n=96 evaluable cases, median age 19 years (IQR 16,32), 72% female, and 27% minor and 46% moderate medical outcomes. Age was significantly associated with INR ($\hat{\beta}=-0.01$; CI -0.01, -0.00). Adjusted models suggest no significant association between oral NAC administration and INR; the association did not vary with time. Repeated post hoc analyses showed no statistically significant change in INR associated with oral NAC administration.</p> <p>Conclusions: There was no causal inference of oral NAC administration on INR in our study sample. Study limitations include the retrospective study design, small sample size, missing/incomplete data, and voluntary/passive reporting of poison center data. An effect of oral NAC on INR remains inconclusive, warranting a controlled prospective clinical trial.</p>

ABSTRACT PPR04	
Name	Joana Arapi
Category	Clinical Doctorate in Pharmacy
Title	<u>Hypertensive Effects of Lead (Pb) Exposure in Children and Adolescents</u>
Authors	Joana Arapi, PharmD. Candidate; Wanqing Liu, PhD; Victoria Tutag Lehr, PharmD.
Abstract	<p>Introduction: Elevated lead (Pb) levels are linked to increased cardiometabolic risk and impaired cognitive, motor, physical and behavioral abilities. Children and adolescents are especially susceptible to the deleterious effects of Pb. Animal models have shown an association between Pb exposure and hypertension. However, the role of Pb in the development of hypertension in children is unknown. Given the correlation between hypertension and cardiovascular disease, elucidating the association between Pb exposure and hypertension is key in order to develop screening and prevention strategies in this vulnerable population.</p> <p>Objective: To characterize the association of Pb exposure on blood pressure in children and adolescents.</p> <p>Methods: A PubMed search using terms Pb exposure, Pb toxicity, heavy metals, children, adolescents, hypertension, blood pressure, treatment, kidney function identified studies from 1985-2021. Studies were evaluated by the primary author and reviewed by co-authors to determine inclusion into the review. Animal models and studies without any results were excluded.</p> <p>Results: Eleven studies were included in the review. Seven studies enrolled children/adolescents. Chronic Pb exposure was associated with increased systolic and diastolic blood pressure in adults and the development of resistant hypertension in adult males. Lead exposure in children and adolescents was associated with significantly greater baseline systolic blood pressure and decreased kidney function supported by significant elevated excretion of thromboxane B2, Clara cell protein and other values. Limitations include few studies in children and adolescents, lack of longitudinal follow-up, and small sample size.</p> <p>Conclusion: Similar to animal models, studies suggest that Pb exposure is a risk factor for the development of hypertension in children and adolescents. However, further research is needed in this vulnerable population to identify and screen those at highest risk, to prevent Pb exposure and to identify potential pharmacotherapeutic interventions.</p>

ABSTRACT PPR05	
Name	Farzaneh Azizi
Category	Clinical Doctorate in Pharmacy
Title	<u>Omega-3 Poly Unsaturated Fatty Acids (PUFA) Therapy for Chronic Inflammatory Pain in Children and Adolescents</u>
Authors	Farzaneh Azizi, PharmD Candidate; Victoria Tutag Lehr BSPHarm, PharmD; Wanqing Liu, PhD
Abstract	<p>Introduction: Chronic inflammatory pain affects up to 35% of children and adolescents worldwide, often accompanied by anxiety and depression significantly decreasing quality of life. Pharmacologic therapy, as part of multimodal management must be safe and effective without interfering with development. Evidence is accumulating on use of omega-3 PUFA supplementation for selected chronic pain conditions to decrease underlying inflammation via immune modulation. However, clinicians require information to guide practice.</p> <p>Objective: To evaluate the evidence for omega-3 PUFA supplementation and associated immunomodulatory effect on chronic inflammatory pain in children and adolescents.</p> <p>Methods: The primary author conducted an extensive PubMed literature review using search terms omega-3 PUFA, human, child, adolescent, pharmacology, pharmacogenomics, chronic inflammatory pain, inflammation, and inflammatory markers to identify randomized controlled trials and other studies from 2010-2021. The primary author evaluated studies based on relevance to the aim, with review by co-authors. In event of differing views on inclusion of a study, the authors came to mutual agreement via discussion after independent review. Studies with no results or protocol feasibility studies were excluded.</p> <p>Results: There were 12 studies meeting criteria from the PubMed database. The majority of studies (n=9) suggest that higher dose of omega-3 PUFA supplementation (>2g/day) administered over >12 weeks duration can decrease underlying inflammation (evidenced by reduced CRP, IL1, IL6, IL-1b, TNFα markers) and in (n=4) studies can alleviate pain (evidenced by significant decrease in pain scores and analgesic use). Limitations include various formulations of omega-3 PUFA and small, heterogeneous study populations. Reported adverse effects were rare and mild.</p> <p>Conclusion: Current evidence suggests Omega-3 PUFA is a safe and effective supplement for management of chronic inflammatory pain when administered in doses >2g/day for >12 weeks. Prospective trials are required to evaluate influence of obesity, dietary ratio omega-3/omega-6 and genetic polymorphisms on efficacy to further inform clinical application.</p>

ABSTRACT PPR06	
Name	Faezeh Azizi
Category	Clinical Doctorate in Pharmacy
Title	<u>Evaluation of Self-Care Monitoring Kits in Reducing 30-Day Readmission Rates in Patients and Improving Self-Care Behaviors with Heart Failure</u>
Authors	Faezeh Azizi, PharmD Candidate; Hannah Ferrari, PharmD; Farzad Daneshvar, PharmD, BCPS; Sean McConachie, PharmD, BCPS
Abstract	<p>Introduction: Despite advances in the field, congestive heart failure (CHF) is among the most expensive conditions treated in U.S. hospitals with national average readmission rate of approximately 21.9%. It has been recognized that patient education is a vital component of CHF management. Self-care education has been demonstrated to reduce length of stay, healthcare cost, and readmission rates in certain studies.</p> <p>Objectives: This study aims to investigate the effect of “Self-Care Monitoring Kits” with pre-discharge education and telephonic post-discharge follow-up calls on 30-day all-cause readmission rates.</p> <p>Methods: The study is a single-center, prospective cohort study of inpatients admitted for congestive heart failure exacerbation who receive self-care education from pharmacy personnel. A total of 200 patients will be assigned to one of the two study arms. The investigational group will receive a novel heart failure self-care kit with education and telephonic post-discharge follow-up calls from clinical pharmacists. The standard of care group will receive usual inpatient care consisted of a heart failure brochure and discharge summary provided at discharge. A Chi-square test will be used to assess the 30-day all-cause readmission rates between the study and control groups. A secondary end point of disease-related self-care behavior changes will be assessed by completion of a modified version of the “Self-Care of Heart Failure Index” at baseline and on day 30 of index admission.</p> <p>Results: Results of this study is to be determined.</p> <p>Conclusion: The goal is to utilize the findings of this study for improvement of the standard of care and reduction of 30-day readmission in patients with CHF.</p>

ABSTRACT PPR07	
Name	Faezeh Azizi
Category	Clinical Doctorate in Pharmacy
Title	<u>Role of Omega-3 Polyunsaturated Fatty Acids (PUFA) in Management of Depression among Children and Adolescents</u>
Authors	Faezeh Azizi, PharmD Candidate; Victoria Tutag Lehr BSP Pharm, PharmD; Wanqing Liu, PhD
Abstract	<p>Introduction: The development of childhood depression negatively affects education, general health, and social life while predisposing to substance use disorder, severe depression, suicidal ideation, and other comorbidities later in adulthood. It is imperative to optimize the assessment and management of mental health conditions for these vulnerable youth. Current antidepressant therapy has varying effectiveness and risks. Recent data suggests that omega-3 PUFA supplementation is a safe and effective therapy for depression. Clinicians require evidence regarding omega-3 PUFA use in practice.</p> <p>Objective: To review the evidence for use of omega-3 PUFA in the management of childhood depression.</p> <p>Methods: The primary author conducted a PubMed search using the terms “omega-3 and depression” to select studies on the safety and efficacy of omega-3 PUFA for depression in children and adolescents. Inclusion criteria were randomized controlled trials in human participants aged ≤18 years with English abstracts between 2015 and 2021. Studies without results or focusing on schizophrenia, ADHD, and psychosis were excluded. Eight trials met the criteria and were reviewed with co-authors.</p> <p>Results: Despite various dosing, all studies administered omega-3 PUFA with a higher EPA:DHA ratio for 12 weeks. Five out of eight studies suggest that omega-3 PUFA supplementation is effective in reducing depressive symptoms as monotherapy or as an adjunct to psycho-educational psychotherapy/anti-depressants. Omega-3 PUFA supplementation was found safe; with common adverse effects reported were fishy taste and belching.</p> <p>Conclusion: Omega-3 PUFA therapy with a higher EPA:DHA ratio given over 12 weeks appear to be effective in reducing depressive symptoms. The optimal dosage regimen is unknown. Studies are limited by small sample size, short duration of therapy, fixed dosing, lack of variability due to genetic/metabolism. Future studies should consider inter-individual variability in pharmacogenomics and PUFA metabolism.</p>

ABSTRACT PPR08	
Name	Ahlam Daoud
Category	Clinical Doctorate in Pharmacy
Title	<u>Impact of Inpatient Intravenous to Oral Modification on Antibiotic Dosing Appropriateness at Discharge</u>
Authors	Ahlam Daoud; Anisa Wooten, PharmD; Sean McConachie, PharmD, BCPS; Dmitriy Martirosov, PharmD, BCIDP
Abstract	<p>Introduction: Despite alerts from electronic medical record software, deviation from approved dosing recommendations is common in clinical practice and can lead to undertreatment or toxicity. Inpatient pharmacists ensure appropriate doses are prescribed based on indication and renal function estimates. However, pharmacists at many health systems do not adjust medication dosages for discharge prescriptions.</p> <p>Objectives: The primary objective is to determine the difference in rates of potentially inappropriate antibiotic prescriptions between patients who received only intravenous antibiotics during their inpatient stay and those who received at least some oral antibiotics during their inpatient stay. The secondary objective is to determine which oral antibiotic classes are most likely to be prescribed at discharge at a dose which is potentially inappropriate.</p> <p>Methods: This was a retrospective cohort of adult patients aged 18 or older with chronic kidney disease stage 3 through 5 (equivalent to a glomerular filtration rate of < 60 mL/min/m² as defined by CKD-EPI equation) who received a prescription for a renally dose-adjusted oral antibiotics at discharge from the study institution between 1/01/2019 and 12/31/2019. Patients were excluded if they were discharged on non-renally-adjusted oral medications, or if their GFR at discharge was greater than 60 mL/min/ m². The patient cohort was divided into two groups: those who received only intravenous antibiotics during hospitalization and those who received oral antibiotics for part of their hospitalization.</p> <p>Results: 95 patients were included in the study with 38 in the intravenous group and 57 in the oral group. A total of 12 patients (31.6%) in the intravenous group received appropriate oral antibiotic prescriptions at discharge compared to 23 (40.4%) patients in the oral group (p=0.39).</p> <p>Conclusion: Patients who received inpatient IV to PO modification were less likely to be prescribed potentially inappropriately dosed antibiotics at discharge compared to those who only received intravenous antibiotics during their hospitalization; however, the difference was not statistically significant. Higher powered studies with larger sample sizes will be required to verify results.</p>

ABSTRACT PPR09	
Name	Michelle Dierker
Category	Clinical Doctorate in Pharmacy
Title	<u>Evaluations of Ceftazidime/avibactam vs. Aminoglycosides and Polymyxins in the Treatment of Carbapenem-resistant Enterobacterales and Multidrug-resistant Gram-negative Organisms</u>
Authors	Michelle Dierker, PharmD Candidate; Sara Alosaimy, PharmD, BCPS, AAHIV, MPH Candidate; Abdalhamid Lagnf, MPH; Andrew Mannino, PharmD; Ashlan J. Kunz Coyne, PharmD; Nickolas Kipreos, PharmD Candidate; Paige Witucki, MPH Candidate; Michael Rybak, PharmD, MP
Abstract	<p>Introduction: Emerging multidrug resistant (MDR) Pseudomonas aeruginosa (PsA) and Carbapenem-resistant Enterobacterales (CRE) has led to use of last resort antimicrobials such as colistin (COL), polymyxin (PMX), and aminoglycosides (AMG). These historical agents are suboptimal due to acute kidney injury (AKI) and the need to often administer as combination therapy. Ceftazidime-avibactam (CZA) is a novel beta-lactam-beta-lactamase inhibitor that appears effective and well tolerated.</p> <p>Objectives: We evaluated effectiveness and adverse effects of the historical agents compared to CZA for MDR infection treatment. The primary outcome was 30-day survival, and secondary outcome was nephrotoxicity (AKI development defined by RIFLE and AKIN criteria).</p> <p>Methods: Design is a retrospective multicenter cohort. Patients included were adults treated with CZA or historical agents for \geq 72 hours to treat MDR PsA or CRE infections. Patients were classified as CZA or historical agents based on first active therapy against the targeted pathogen. Patients excluded from the trial include those receiving overlapping therapy with any other study followers for > 48 hours. Patients with end stage renal disease or AKI before study drug initiation were excluded from nephrotoxicity analysis.</p> <p>Results: Data was analyzed from 145 patients (CZA, n=57 and COL/PMX/AMG, n=51,10,27). Patient population had a median age of 61 (51-72) and were mostly African American (58%) and male (61%). Commonly treated infections were respiratory (52%) and urinary tract (18%) with the most prevalent pathogens being PsA (61%) and Klebsiella pneumoniae (53%). CZA had higher rates of 30-day survival compared to the historical agents (P=0.028). AKI occurred more often with historical agents (40%,48%) compared to CZA (40%,43%) for both AKIN (P=0.0010) and RIFLE criteria (P=0.0035) with a number needed to harm of 12.5 and 33.3.</p> <p>Conclusion: In the management of MDR PsA and CRE, CZA had higher rates of 30-day survival and less incidence of AKI compared to historical agents.</p>

ABSTRACT PPR10	
Name	Paul Dobry
Category	Clinical Doctorate in Pharmacy
Title	<u>Toxicity of Volatile Organic Compounds (VOCs) and VOC Mixtures in Aquatic Model Organisms</u>
Authors	Paul Dobry, Zoha Siddiqua, Brooke Penny, Dima Awad, David Pitts, PhD
Abstract	<p>Introduction: A group of volatile organic compounds (VOCs) derived from petroleum, benzene, toluene, ethylene, and xylene (BTEX) are of particular concern due to widespread human exposure and possible connection to pre-term births (Cassidy-Bushrow, 2020). Studies of BTEX can be challenging because these chemicals volatilize at room temperature, which makes it difficult to assess human exposure risks and to conduct experiments designed to determine biological effects. These VOCs also exist as chemical mixtures, so the adverse effects associated with exposure to a single VOC may not accurately reflect the real-world impact of environmental exposure.</p> <p>Objectives: A novel sealed bioassay system was developed to quantify behavioral effects of BTEX in <i>Daphnia pulex</i>. This assay will be used to identify any potential additive, synergistic or antagonistic interactions among the constituents that may be responsible for the overall toxic effects of a chemical mixture. The long-term goal is to identify genomic changes and potential biomarkers of VOC exposure.</p> <p>Methods: A glass-covered stainless-steel chamber was used to monitor swimming behavior using a digital camera. Cumulative VOC concentration-response studies were conducted over a four-hour period. The distance moved (mm per 5 sec) and turning (mean angle in degrees) were calculated from 5 second video files taken every 10 minutes during exposure. <i>D. pulex</i> were exposed to toluene (0-25ppm; n=12) and benzene (0-40ppm; n=12) for 1-hour at each concentration in the cumulative concentration-response design. In addition, the response to selected individual VOC concentrations was monitored over 4 hours.</p> <p>Results: Toluene (25ppm) and benzene (20ppm) significantly decreased the accumulated distance traveled while toluene (25ppm) and benzene (40ppm at 270-280 minutes) significantly increased turning (mean angle) of the <i>Daphnia</i> compared to control.</p> <p>Conclusion: Toluene and benzene have been shown to significantly affect <i>daphnia</i> swimming behavior in a sealed assay system that will enable studies of VOC mixtures.</p>

ABSTRACT PPR11	
Name	Paige Hanke
Category	Clinical Doctorate in Pharmacy
Title	<u>Older Adults' Perspectives of Healthcare Providers' Communication Skills and Attributes</u>
Authors	Paige Hanke, 2023 PharmD candidate; Brittany Stewart, RD, PharmD; Aline Saad, PharmD; Jennifer Mendez, Ph.D
Abstract	<p>Introduction: Older adults (OAs) have increased healthcare needs that require healthcare providers to focus on skills needed to improve patient-centered care. The Institute of Medicine recognized patient-centered care as one of six elements of high-quality healthcare. However, the components of communication behavior that facilitate or hinder effective patient-centered care are less understood. Understanding OAs' perspectives about healthcare providers' communication skills could lead to improved patient-centered care and patient satisfaction. Wayne State University's healthcare students participate in an interprofessional team visit (IPTV) that includes multi-disciplinary students that collaborate to provide a patient-centered care plan. During the visit, OAs answer survey questions regarding their perspectives about healthcare provider communication skills and attributes.</p> <p>Objective: To evaluate older adults' perspectives about healthcare providers' attributes and communication skills.</p> <p>Methods: Third year student pharmacists assigned to an interprofessional team participated in a healthcare visit with an OA. During the visit, the student asked the OA one of three possible survey questions to obtain their perspective of healthcare providers' communication skills and attributes. An inductive thematic analysis was used to evaluate responses.</p> <p>Results: Ninety-five survey responses were collected in January and October 2019. Participant ethnicity included African American (37%) and Caucasian (61%). OAs described healthcare provider qualities and the three key themes that emerged include patient rapport, empathy, and quality care. Twenty-two OAs reported an issue communicating with a healthcare provider. Fifty-eight OAs reported observing miscommunication between providers. OAs provided recommendations to improve healthcare provider communication.</p> <p>Conclusion: This study highlights OAs' perspectives of healthcare provider communication skills. These findings could lead to improved patient-centered care and support the need for enhanced training for healthcare students related to communication skills.</p>

ABSTRACT PPR12	
Name	Rola Hariri
Category	Clinical Doctorate in Pharmacy
Title	<u>Assessment of the Process for Obtaining and Using Patient Information Needed in the Care of Patients in a Community Pharmacy with a focus on Patients with Hypertension</u>
Authors	Rola Hariri Pharm.D. Candidate 2022, Hassan Khatib Pharm.D. Candidate 2022, Hanadi Thomas Pharm.D., Francine Salinitri, Pharm.D., Richard Lucarotti, Pharm.D.
Abstract	<p>Introduction: For pharmacists in the community setting to conduct comprehensive drug therapy reviews, pharmacists must obtain a patient's medical and medication history. Our study aims to test the feasibility of implementing a patient intake form in the community setting and monitor hypertension patients over a period of 6 months.</p> <p>Objective: To assess the process of using a self-completed medical and medication history form in the community practice setting.</p> <p>Methods: Prospective study conducted in collaboration with Eugene Applebaum College of Pharmacy and Health Sciences and Merriman Drugs in Livonia, MI, an independently owned community pharmacy. Participants ages 18 and older who filled medications at the pharmacy were invited to complete a medical and medication history (MnM) form using either an electronic or paper version beginning August 2021. A student pharmacist reviewed the MnM form with the patient for completeness and discussed any areas that were not addressed by the patient. The time for the participants to self-complete the form and for the student pharmacist to review the form were recorded. Patient care plans were developed for all participants and any drug-related problems were identified, addressed, and documented. Participants who were identified to have hypertension were further instructed regarding follow up at 1, 3 and 6 month intervals to assess their adherence and blood pressure over time. Participants completed a survey that assessed their attitudes towards use of the MnM form.</p> <p>Results: Preliminary data of 15 patients shows the mean time to complete the paper and electronic versions of the form was 8.1 minutes and 13.1 minutes respectively. The average student pharmacist review time was 6 minutes and 24 seconds.</p> <p>Conclusion: The use of a self-completed medical and medication history form within a community pharmacy setting is feasible and allowed the pharmacist to identify drug related problems that were ongoing with patient therapy.</p>

ABSTRACT PPR13	
Name	Nishad Joshi
Category	Clinical Doctorate in Pharmacy
Title	<u>Evaluation of heparin use in patients receiving therapeutic warfarin prior to hospital admission</u>
Authors	MIRYAN ELIAS, PHARMD CANDIDATE; NISHAD JOSHI, PHARMD CANDIDATE; NORMAN BUSS, PHARMD; MARILEN MARTINEZ, PHARMD; VINCE PROCOPIO, PHARMD
Abstract	<p>Introduction: There are no guidelines on unfractionated heparin (UFH) dosing for patients presenting to the hospital on warfarin with a therapeutic INR. Hospitals within the Henry Ford Health System (HFHS) have varying ways of addressing this scenario. Hospital A gives a normal bolus followed by half the normal infusion rate while hospitals B, C, and D do not make dose adjustments based on INR.</p> <p>Objectives: The aims for this study were to determine if each hospital followed their protocol when dosing UFH for cardiac indications, if therapeutic aPTTs are achieved within 24 hours of initiation, and the rate of bleeding events.</p> <p>Methods: This was a retrospective, observational cohort study of adult patients admitted to HFHS from June 1st, 2019 to June 1st, 2021. Patients initiated on UFH for cardiac indications and on warfarin prior to admission with an INR of 2-3.5 were included. Analysis involved reviewal of the administered bolus and infusion rate, aPTTs within 24 hours of infusion initiation, baseline INR, and bleeding events.</p> <p>Results: 100 patients were included with 33 from hospital A and 67 from hospitals B, C and D (control group). 48.5% of hospital A and 25% of the control group received a bolus with 45.5% and 17.9% following protocol, respectively. For UFH infusion initiation, 45.5% of hospital A and 76.1% of the control group followed protocol. 45.5% of hospital A patients and 20.9% of the control group had therapeutic aPTTs. When dose adjusting, 72.7% of hospital A followed protocol with 42.4% achieving therapeutic aPTTs and 46.3% of the control group followed protocol with 34.3% achieving therapeutic aPTTs. There were no bleeding events in either group.</p> <p>Conclusion: Hospital A achieved therapeutic aPTTs within 24 hours at a higher rate than the control group. Further studies are needed to determine the best protocol to approach this situation.</p>

ABSTRACT PPR14	
Name	Kimia Khatib-Shahidi
Category	Clinical Doctorate in Pharmacy
Title	Prevalence of Inappropriate Aspirin Use in Hospitalized Patients Taking Oral Anticoagulants
Authors	Kimia Khatib-Shahidi, PharmD Candidate; Hannah Ferrari, PharmD; Sean McConachie, PharmD; Sabrina Jarjosa, PharmD; Jennifer Froomkin, PharmD
Abstract	<p>Introduction: Combination therapy with oral anticoagulants (OAC) and aspirin is common in practice and recommended for patients with both acute coronary syndromes and an indication for anticoagulation such as atrial fibrillation (AF) of venous thromboembolism (VTE). However, combination therapy also increases the risk for bleeding, so diligent pharmacoevaluation is necessary in these patients. Previous research suggests that many ambulatory patients are on combination therapy without an appropriate indication for aspirin. Research on inpatients is currently limited.</p> <p>Objective: The primary objective of this research project is to evaluate the prevalence of inappropriately prescribed aspirin in hospitalized patients who are receiving OAC. The secondary outcome is to determine the impact of pharmacists on discontinuing inappropriately prescribed aspirin therapy.</p> <p>Methods: This is a single-center, retrospective study of inpatients who received both aspirin and an OAC during their admission to Beaumont, Dearborn in the year 2019. Patients who were pregnant, discharged on a parenteral anticoagulant, or received only one dose of aspirin during their admission will be excluded. The electronic medical record will be used to assess whether patients received aspirin for an appropriate or inappropriate indication. Appropriate indications will include mechanical valve, peripheral artery disease with stent, VTE with stent or AF with stent. All other indications will be considered inappropriate. Additional data will be collected on the medication, indication, and dose of the OAC, the indication and dose of aspirin, pharmacist recommendations regarding aspirin or OAC, and patient comorbidities which increase the risk of bleeding. Descriptive statistics will be used to summarize the findings including the prevalence of inappropriate combination therapy. Two hundred patient charts will be reviewed to collect a generalizable sample.</p> <p>Results: Results are pending.</p> <p>Conclusion: Results of this study can determine the prevalence of inappropriate aspirin use in the inpatient setting and guide future practices for hospital pharmacists.</p>

ABSTRACT PPR15	
Name	Lauren Krumm
Category	Clinical Doctorate in Pharmacy
Title	<u>Assessment of the Process for Obtaining and Using Patient Information Needed in the Care of Patients in a Community Pharmacy</u>
Authors	Lauren Krumm Pharm.D. Candidate 20221, Jacqueline Feist Pharm.D. Candidate 20221, Jaime Spellman Pharm.D.2, Francine Salinitri, Pharm.D.1, Richard Lucarotti, Pharm.D.1
Abstract	<p>Introduction: Patient medical and medication history is key information for pharmacists to identify drug related problems (DRPs), but this information is not readily available to pharmacists in the community setting. A previous Wayne State University (WSU) study found that a patient self-completed medical and medication history (MnM) form was a feasible method of obtaining this necessary information.</p> <p>Objectives: The primary objective is the feasibility and impact of a patient self-completed MnM form.</p> <p>Methods: Prospective study conducted in collaboration with WSU EACPHS and Highland Pharmacy in Waterford, MI. Preliminary data was collected from August to September 2021. Participants ≥ 18 years of age who fill prescriptions at the pharmacy were invited to self-complete an MnM form. Investigators reviewed completed forms with participants, created care plans and identified DRPs. DRPs identified were categorized and addressed with participants and/or providers. Participants completed a survey to assess their attitudes regarding the form.</p> <p>Results: Of 122 participants approached, 41 completed the form and survey, and 34 (27.9%) completed all parts of the study to date (form, survey, and follow-up). For this interim analysis, the 34 completed participants are included. In total, 123 DRPs were identified, and 82 corresponding interventions were accepted by the participants (66.6%). The most common DRP identified was "Need for Additional Therapy" (86.2%) and the most common intervention type was direct to patient (95.9%). Of 41 completed surveys, 95% of participants indicated they understood and the questions and were comfortable answering them, 93% understood why the pharmacist needed this information, 98% indicated they would update the form, and 90% indicated the investigators made certain their medications were the best choice for them.</p> <p>Conclusion: The use of a patient self-completed MnM form is a feasible approach to collect key information needed to identify and resolve drug related problems in a community pharmacy.</p>

ABSTRACT PPR16	
Name	Raluca Laza
Category	Clinical Doctorate in Pharmacy
Title	<u>HPV Vaccination: First-Year College Students' Beliefs & Attitudes</u>
Authors	Raluca Laza, BS; Joseph Fava, PharmD; Steve Erickson, PharmD
Abstract	<p>Introduction: Human papillomavirus (HPV) infection is associated with cervical, oropharyngeal, penile and other cancers. The HPV vaccine provides protection against nine virus subtypes including four high-risk subtypes and is highly safe and effective in reducing infection rates to prevent pre-cancers and cancers. Despite this and the CDC's recommendation for routine immunization at age 11-12 years, only 42.7% of males and 45.3% of females age 13-17 years in Michigan have completed their vaccine series.</p> <p>Objectives: to assess first-year university students' knowledge, attitudes, beliefs, and perceptions (KABPs) regarding HPV and the HPV vaccine.</p> <p>Methods: three independent investigators developed a web-based 50-question mixed qualitative-quantitative survey to assess KABPs regarding HPV and HPV vaccination KABPs. The survey was deployed to first-year students at the University of Michigan and Wayne State University. The project was IRB-approved as non-medical/exempt research. Survey results were analyzed using descriptive statistics.</p> <p>Results: ninety-nine survey responses were recorded. 10% of respondents had not heard of HPV or were unsure. 65% of respondents said they are aware of some ways in which HPV can be spread. 67% have received at least one dose of the HPV vaccine (N=67). From these respondents 42% received their first dose between 9-12 years of age. 57% received their first dose between 13-17 years of age. And only 3 respondents received their first dose at 18 or older. Out of 67 receiving the vaccine, 36% noted that the decision to receive the vaccine was made by their HCP and parents (did not include themselves in the decision). Common vaccination barriers included uncertainty about need, concerns about side effects, fear of needles, concerns about efficacy, and transportation to clinic.</p> <p>Conclusion: this information can be used to better tailor education efforts to improve HPV vaccine uptake in college-aged students and in any students needing catch-up immunization.</p>

ABSTRACT PPR17	
Name	Mohammed Mohammed
Category	Clinical Doctorate in Pharmacy
Title	A "Hands on" Public Service Program to Help People Stay Sober and Safer on the Roadway
Authors	Mohammed B Mohammed, Jessica Andrews, Zanab Shareef, Edison Nwobi, Tariq Masrizada, Tyiesha Head, Tylor Zohr, Doreen Head, Randall Commissaris
Abstract	<p>Introduction: Despite the existence of many different “Don’t drink and drive” programs and campaigns over the past 30 years, alcohol intoxication has continued to account for approximately one quarter to one third of all traffic crashes and crash-related deaths in the United States. The present study describes a new “hands on” evidence-based approach involving real alcohol-intoxicated subjects using a virtual reality (VR) driving games to educate the public more effectively about the dangers of drunk driving</p> <p>Objectives: To describes a hands-on public awareness outreach program for demonstrating the hazards of (real) drunk driving, and the relationship between BAC levels and driving performance and to demonstrate the impairing effects of ethanol on driving.</p> <p>Methods: A single demonstration subject ‘drove’ a VR-based portable driving simulator on multiple occasions before and at 30 minute intervals for up to six hours after either no alcohol, 2, 4 or 6 ‘drinks’ (3, 6, or 9 ounces of 80 proof vodka). The defensive driving task was a choice reaction crash avoidance steering maneuver. The primary dependent variable was the latency to initiate an avoidance steering response. Blood Alcohol Concentration (BAC) determinations were conducted immediately prior to driving tests using BAC Track portable breathalyzer.</p> <p>Results: Alcohol increased crash-avoidance reaction time. Peak BAC values were 35, 78 and 120 mg/dl for 2,4 and 6 drinks, respectively; the decline in BAC was comparable and linear for all three treatments. There was a strong correlation ($r=0.85$) between pre-drive BAC level and reaction time and a significant increase in crash avoidance reaction time when the BAC was 50-79 mg/dl.</p> <p>Conclusion: These results demonstrate that this VR-based driving simulator task could be a useful tool for providing public service demonstrations regarding the hazards of drinking and driving and a BAC concentration of 50 mg/dl represents a reasonable evidence-based cut-off for alcohol-impaired driving.</p>

ABSTRACT PPR18	
Name	Regina Pacitto
Category	Clinical Doctorate in Pharmacy
Title	<u>Evaluation of the Effect of High-Dose versus Standard-Dose Dexamethasone on Mortality Among Mechanically Ventilated COVID-19 Patients: A Preliminary Report</u>
Authors	Regina Pacitto, Pharm.D Candidate; Lauren Krumm, Pharm.D. Candidate; Anna Hejnar, Pharm.D Candidate; Pramodini B. Kale-Pradhan, Pharm.D; Christopher Giuliano, Pharm.D; Leonard Johnson, MD
Abstract	<p>INTRODUCTION: More than 100,000 new cases of COVID-19 illness occur in the United States each day, and 6-10% of these patients may require mechanical ventilation. Anti-inflammatory agents such as dexamethasone have become a mainstay of treatment. A randomized clinical trial found that a 6mg daily dose of dexamethasone improves patient outcomes in hospitalized COVID-19 patients receiving oxygen. However, clinicians often prescribe higher doses of corticosteroids despite sparse evidence to support this practice. No studies have been published to-date comparing COVID-19 patient outcomes following treatment with standard-dose versus high-dose dexamethasone specifically in ventilated patients.</p> <p>OBJECTIVES: The primary outcome of this study was to evaluate the association between mortality and standard (=/6mg daily) dexamethasone in mechanically ventilated COVID-19 patients. Secondary outcomes included average blood glucose (BG), number of BG readings above 200, incidence of bacterial nosocomial infection, and the association between average daily dexamethasone dose and mortality as well as ventilator-free days.</p> <p>METHODS: This was a multi-site, retrospective, observational study conducted via chart review of COVID-19-positive, mechanically ventilated adult patients who received at least two doses of dexamethasone at either Ascension St. John Hospital or Ascension Macomb-Oakland Hospital between June 1, 2020 and May 31, 2021.</p> <p>RESULTS: Data collection for this study is ongoing. Here we present preliminary findings from analysis of N=134 patients in a 3:1 high:standard-dose ratio. Preliminary data demonstrate no significant effect of dexamethasone dose on mortality, average BG, number of BG readings >200, incidence of nosocomial infection, or ventilator-free days ($p>0.05$).</p> <p>CONCLUSION: Preliminary data suggest that higher doses of dexamethasone do not significantly impact clinical outcomes such as mortality among ventilated COVID-19 patients. These results may be used to guide clinical decisions regarding optimal dexamethasone dosing in future COVID-19 patients.</p>

ABSTRACT PPR19	
Name	Nicholas Panecaldo
Category	Clinical Doctorate in Pharmacy
Title	<u>Prescribing Patterns of SSTI Infections in Patients Discharged from the ED</u>
Authors	Jacqueline Feist, Pharm. D Candidate; Nicholas Panecaldo, Pharm. D Candidate; Pramodini B. Kale-Pradhan, Pharm. D; George Delgado Jr, Pharm. D; Christopher Giuliano Pharm. D; Leonard Johnson, MD
Abstract	<p>Background: Treatment of skin and soft tissue infections (SSTIs) are a growing reason for Emergency Department (ED) visits. Inadequate initial treatment of SSTIs has been reported in up to 25% of patients treated in ED.</p> <p>Objectives: The purpose of this project was to describe prescribing patterns for SSTIs in the ED.</p> <p>Methods: Single center retrospective cohort study of SSTI patients discharged from ED between July 1st, 2020 through December 31st, 2020. The primary outcome is to describe the proportion of patients receiving guideline directed therapy (GDT) for SSTIs. Secondary outcomes include describing the proportion of patients readmitted within 30 days, the reason for readmission, and to compare 30-day readmission rates in patients who received GDT versus non-GDT.</p> <p>Results: Of 876 patients screened, 576 were excluded primarily for inpatient treatment. Of the 300 included patients, 117 (39%) received GDT and 183 (61%) received non-GDT. Fifty-six of 300 patients were readmitted within 30 days; readmission rates for the patients receiving GDT and non-GDT were 17.9% and 19.1% respectively (p=0.8). Of the 56 readmissions, 20 (35.7%) were related to the SSTI and returned for persistent symptoms (19 patients) or development of sepsis (1 patient). The other 36 patients (64.3%) were readmitted for reasons unrelated to SSTI. There was no significant difference between GDT and non-GDT in terms of readmissions related to persistence or progression of original SSTI, 9 patients and 11 patients respectively (p=0.57).</p> <p>Conclusion: The majority of prescribed antibiotic therapy for SSTI did not conform to GDT. However, 30-day readmission rates were not significantly different between the groups. Further research on GDT and ED treated SSTI is needed.</p>

ABSTRACT PPR20	
Name	Karli Pelaccio
Category	Clinical Doctorate in Pharmacy
Title	<u>COVID-19 Effects on Birth Control Use, Adherence, and Access Including Pharmacist Prescribing Services</u>
Authors	Karli Pelaccio, PharmD Candidate; Heather Dillaway, PhD; David Bright, PharmD; Mary Beth O'Connell, PharmD
Abstract	<p>Introduction A Healthy People 2030 goal is to reduce unintended pregnancies by increasing access for contraceptive services. The COVID-19 pandemic influenced healthcare with effects on birth control (BC) unknown. Pharmacist prescribing BC could help solve access problems.</p> <p>Objectives Analyze impact of COVID-19 pandemic on BC use, adherence, and access, and perceptions of pharmacist prescribed BC.</p> <p>Methods Thirty-one community pharmacies throughout MI distributed 2,175 survey envelopes that included study description, survey link, and a candy bar. A Native American clinic newsletter and LGBT support center website posted survey invites. Participants were women 18-45 years old. Recruitment lasted three months. The 50-item investigator developed survey had 12 demographic, 6 pandemic impact, 7 sexual activity, 17 BC use, adherence and access, and 8 perceptions of pharmacy services including prescribing BC items. Descriptive analyses conducted with SPSS v27.</p> <p>Results 147 surveys were analyzed. Respondents were 29±7.3 years old, and mostly white (77%), straight (81%), and from southeastern MI (52%). 58% of respondents used prescription BC, most using oral pills (76%) to prevent pregnancy (84%). 25% BC users were worried about BC access and 27% had difficulty taking BC regularly during the pandemic. 24% BC users had an appointment for BC canceled, which was rescheduled (14%), switched to telehealth (7%), or not rescheduled (3%). Half of the respondents would likely use pharmacist prescribed BC if available with advantages being more convenient than visiting a doctor's office (71%) and easier to access (69%). The major concern about pharmacists prescribed BC was women not receiving PAP smears and screenings (61%). Respondents reported high confidence (72%) in pharmacist prescribed BC and believe it would help prevent unintended pregnancies (69%).</p> <p>Conclusion A quarter of the sample experienced some challenges with BC use, adherence, and access during the pandemic. Many respondents saw value in pharmacist prescribed BC.</p>

ABSTRACT PPR21	
Name	Zenab Rashid
Category	Clinical Doctorate in Pharmacy
Title	<u>Motivating Factors and Barriers of Pharmacist Prescribing Birth Control in Michigan Community Pharmacies</u>
Authors	Zenab Rashid, PharmD Candidate; Mary Beth O'Connell, PharmD, BCPS; Kai Yang, PhD
Abstract	<p>Introduction: A public health initiative is to lower the 45% unintended pregnancy rate. Although pharmacists prescribing birth control is beneficial, implementation is low. Enhancing motivators and overcoming barriers could increase implementation.</p> <p>Objectives: To quantify the motivating factors and barriers to pharmacists prescribing birth control (BC) and compare them by desire to implement BC prescribing.</p> <p>Methods: Theoretical Domains Framework was used to develop a 41-item investigator-developed survey. Survey mailed to Michigan chain pharmacies granting permission and all independent pharmacies. Participants entered a raffle for one of five \$100 gift cards. Descriptive and nonparametric analyses conducted with SPSS v27; with $p \leq 0.05$ significance.</p> <p>Results: Survey response rate was 11% (n=147). Pharmacies were national chain (15%), grocery store (15%), independent (39.5%), small independent group (2-4 stores, 21.8%), and large independent group (\leq stores, 8.8%). Top motivators to implement this service were to increase scope of practice, patient access to contraception, and pharmacy revenue. Top pharmacist, financial, resource, and safety barriers were contraception knowledge gaps, lack of financial reimbursement, lack of physicians to create a collaborative practice agreement, and increased liability, respectively. Pharmacies wanting to implement this service (n=85) were motivated by competition ($p < 0.001$), were early change adopters ($p < 0.001$), wanted to implement more direct patient care ($p < 0.001$), could create collaborative practice agreements ($p < 0.001$), had needed resources ($p < 0.001$), and felt their patients would value ($p < 0.001$) and use ($p < 0.001$) pharmacists prescribed BC than pharmacies not wanting to implement this service (n=61). Geographical location, city size, pharmacy type, and prescription volume did not significantly differ between pharmacies wanting to implement or not this service.</p> <p>Conclusion: Enhancing patient care and advancing pharmacy services were the top motivators. Many implementation barriers existed requiring future development and advocacy efforts. Pharmacies wanting to implement this service had more positive attitudes, and better knowledge, skills, and resources than those not wanting to implement.</p>

ABSTRACT PPR22	
Name	Thomas Rowbal
Category	Clinical Doctorate in Pharmacy
Title	<u>Antidepressants and the genome: the association between SSRI therapy and epigenetic markers</u>
Authors	Thomas Rowbal, PharmD Candidate Kyle Burghardt, PharmD
Abstract	<p>Introduction: Selective serotonin reuptake inhibitors (SSRIs) are first-line therapy for major depressive disorder and are utilized for several other conditions as well. Although commonly used, their effectiveness at treating symptoms of depression can be unpredictable, often prompting a trial and error of multiple antidepressants before an effective treatment is found. Additionally, there are several well-known adverse effects of this class that may limit their use, such as sleep disruption and sexual dysfunction. These mechanisms have not been fully elucidated, but it is suggested that epigenetics, the interplay of genetics and environment, may play a role. To date, several epigenome-wide studies have been performed in populations treated with SSRIs. However, these studies can include hundreds of significant epigenetic sites, making it difficult to interpret which epigenetic regions are relevant to the mechanism and effectiveness of SSRI therapy.</p> <p>Objectives: Our goal was to perform a systematic review and pathway meta-analysis of studies that have investigated the effects of SSRIs on the DNA methylome.</p> <p>Methods: A search was performed on several databases, such as PubMed and Embase, identifying five studies that fit the criteria for inclusion in our analysis. In each of these studies, the top differently methylated sites were extracted and entered into a pathway analysis program. Significant pathways of interest that were identified included signaling, metabolism, and biosynthesis pathways.</p> <p>Results: Within our study we performed a meta-analysis based on reported DNA methylome results in populations treated with SSRIs. This methodology could be employed to synthesize the numerous, individual epigenomic studies that exist in the literature for various therapies and attempt to highlight epigenomic regions of interest for further, targeted study.</p>

ABSTRACT PPR23	
Name	Marielle Stepho
Category	Clinical Doctorate in Pharmacy
Title	<u>Developing a Program to Improve Future Pharmacists' Personal Digital Brand</u>
Authors	Marielle Stepho (PharmD candidate), Anita Yousef (PharmD candidate), & Dr. Gortney (PharmD)
Abstract	<p>Introduction: Developing a personal digital brand can be useful for self-marketing. Given the challenges in the current pharmacy workforce and post-graduate employment rates, providing direction to student pharmacists in positive social media use and document building for seeking employment may be beneficial. Online branding could be vital for graduates to differentiate themselves from other job candidates.</p> <p>Objectives: To develop a program for fourth year student pharmacists to enhance their awareness of positive social media use for professional development and provide training related to best practices for personal digital branding in use of social media, resumes, and portfolios.</p> <p>Methods: An evaluation of the professional landscape and potential need for training in developing a personal digital brand and employment documents for postgraduate employment needed conducted. Three initial steps were taken to develop program background. A literature search was conducted, PharmD and pharmacy program data was evaluated, and a student needs assessment was developed. A 12 item survey was developed and sent through Qualtrics to obtain students' perceptions of (1) social media including personal and professional use and (2) resume and CV characteristics.</p> <p>Results: Data from existing literature showed that pharmacists and student pharmacists don't regularly use social media to develop a personal digital brand. The student survey response rate was 21% (20/95). Students used social media slightly more personally than both professionally and personally, and 85.7% were interested in building a personal digital brand on LinkedIn. Only 55% thought they were well represented professionally online, and most agreed that their resumes could utilize assistance with content development.</p> <p>Conclusion: Students could benefit and are interested in training to develop a personal digital brand, networking, and effective resumes. As a result, experts were recruited to develop a two-part workshop focused on best practices.</p>

ABSTRACT PPR24	
Name	Jorden Tan
Category	Clinical Doctorate in Pharmacy
Title	<u>Prescribing Patterns for Urinary Tract Infections in Patients Discharged from the Emergency Department</u>
Authors	Jorden Tan, Pharm.D Candidate; Kenneth Kue, Pharm.D Candidate; Pramodini B. Kale-Pradhan, Pharm.D; Christopher Giuliano Pharm.D; George Delgado Jr, Pharm.D; Leonard Johnson, MD
Abstract	<p>Introduction: Urinary tract infections (UTIs) are one of the most common infections in the emergency department (ED). The risk of treatment failure and readmissions to the ED may be increased with inappropriate antibiotic regimens. The purpose of this project is to determine the proportion of patients receiving guideline-based therapy (GBT) for UTI discharged from the ED.</p> <p>Objectives: The primary outcome is to describe the proportion of patients discharged from the ED who received GBT for UTI. Secondary outcomes are to define the proportion of patients readmitted within 30 days, to describe the reason for readmission, and to compare 30-day readmission rates in patients who received GBT versus non-GBT.</p> <p>Methods: Single-center, retrospective cohort study of adult patients diagnosed with an UTI or pyelonephritis from July 1, 2020 to December 31, 2020.</p> <p>Results: Of 280 patients screened, 48 were excluded primarily for inpatient admission. Of the 232 patients included in the preliminary analysis, 134 (58%) received GBT and 98 (42%) received non-GBT. Thirty-nine of 232 patients (16.8%) were readmitted within 30 days. Readmission rates for the patients receiving GBT and non-GBT were 59% and 41% respectively (p=0.866). Of the 39 readmissions, 14 (35.9%) were related to the UTI and returned for persistent symptoms (11 patients) or development of sepsis (3 patients). The other 25 patients (64.1%) were readmitted for reasons unrelated to UTI. There was no significant difference between GBT and non-GBT in readmissions related to persistent symptoms of UTI or development of sepsis, 9 patients and 5 patients, respectively (p=0.92).</p> <p>Conclusion: In the preliminary analysis, the majority of prescribed antibiotic therapy did conform to GBT for UTI. However, 30-day readmission rates were not significantly different between groups.</p>

Undergraduate Students

ABSTRACT UG01	
Name	Azalea Miller
Category	Undergrad
Title	<u>Effectiveness of Magnetic Resonance Guided Radiotherapy vs Image Guided Radiotherapy in Head and Neck Cancers</u>
Authors	Azalea Miller, Cheryl Sturkey, Glendy Corbin, Neda Aldalali, Olivia Becker, Rani Jamil, Ranya Alshahri, Kaylee Bell and Steven Forgue
Abstract	<p>Spanning the last two decades radiotherapy has dramatically increased its ability to achieve its goal in visualization of tumor volumes which in turn allows more accuracy in shrinking the size and eradicating cancer cells. This has been accomplished by improving 2D, 3D-conformal, and image-guided capabilities. In gathering further information from various sources, it has been found that further enhancing the ability to visualize disease during treatment through Magnetic Resonance Guided Radiotherapy(MRgRT) versus current Image guided Radiotherapy has shown to be substantially more accurate for tumor visualization. In addition to accurate treatment control, MRgRT has decreased the dosage to critical structures, as well as decreased the intensity of side effects in head and neck cancers, thus contributing to better treatment outcomes(Howard and Jordan¹). In one study (Simon et. al (2021)) performed post treatment, an MRLinac detected spatial changes, adapted and contoured the changes in structure size of parotid glands and then successfully treated sparing excess dose to the glands. When treatments lack adaptability control that exists within MR-linac treatments, the chance of damaging critical structures which cannot withstand strong doses can result in more extreme side effects, which in turn can be detrimental to the functionality and quality of life of the patient.</p>

ABSTRACT UG02	
Name	Emily Myers
Category	Undergrad
Title	<u>Augmented Balance Training in Persons with Multiple Sclerosis: A Case Series</u>
Authors	Myers E, Kloos A, Kegelmeyer D, Fritz NE
Abstract	<p>Augmented Balance Training in Persons with Multiple Sclerosis: A Case Series</p> <p>Myers E1, Kloos A2, Kegelmeyer D2, Fritz NE3</p> <p>1 Department of Health Care Sciences, Wayne State University, Detroit MI 2 Department of Physical Therapy, The Ohio State University, Columbus OH 3 Department of Neurology, Wayne State University, Detroit MI</p> <p>Introduction/Objectives: Multiple sclerosis (MS) impacts balance and walking ability. The use of feedback to augment balance training can enhance functional gains in persons with neurologic disorders, but the extent to which these gains are realized in persons with higher and lower disability is unknown. This case series examined how an intensive video-game based training impacted functional performance in persons with higher and lower disability from MS.</p> <p>Methods: Physically inactive individuals with relapsing-remitting MS were randomized to either the video-game intervention group (n=4; n=2 with Expanded Disability Status Score (EDSS) >3, n=2 with EDSS3, n=2 with EDSS3 (i.e., greater disability) demonstrated the largest gains in forward walking velocity (35.2% and 6.7% increase), dual-task walking velocity (17.7% and 8.1% increase), and Berg Balance Scale (39.6% and 3.9% increase). Further, individuals with EDSS>3 met or exceeded established MDCs for the Berg Balance Scale and 6 Minute Walk Test following training.</p> <p>Conclusion: Persons with MS may experience benefits in walking speed, walking endurance, and balance following augmented balance training. In this case series those with greater disability demonstrated the largest gains. The augmented nature of the training may also require increased cognitive demand, as evidenced by post-training improvements in dual-task walking. Thus, intensive balance training is feasible in persons with MS-related disability and may confer greater benefits than in those with lower disability. The study had high adherence levels and no adverse events occurred.</p>

ABSTRACT UG03	
Name	Mark Sabit
Category	Undergrad
Title	<u>Comparing Breast Cancer Radiation Therapy Fractionation Schedules: A Look at Recurrence and Survival</u>
Authors	Mark Sabit; Brianna Zettel
Abstract	<p>Introduction: Radiation therapy is a treatment modality for women with breast cancer. Hypofractionation schedules allow patients to receive a lower total radiation dose while increasing the daily dose and decreasing the number of treatments.</p> <p>Objectives: To determine if a hypofractionation treatment course has fewer cancer recurrences and longer survival times.</p> <p>Methods: A literature search was conducted comparing hypofractionation to conventional fractionation using the Wayne State University library.</p> <p>Results: There are no significant differences between patients who have been treated with hypofractionation compared to conventional fractionation. With different hypofractionation schedules, the number of patients with local recurrence and cancer related deaths were similar.</p> <p>Conclusion: This literature review did not compare the long term and short term side effects of patients treated with hypofractionation and conventional fractionation. Hypofractionation may be used for eligible patients due to their similar results, regarding recurrence and survival.</p>

