

HPD RESEARCH DAY

February 16, 2018

Dr. Kiran C. Patel College of Osteopathic Medicine

College of Pharmacy

College of Optometry

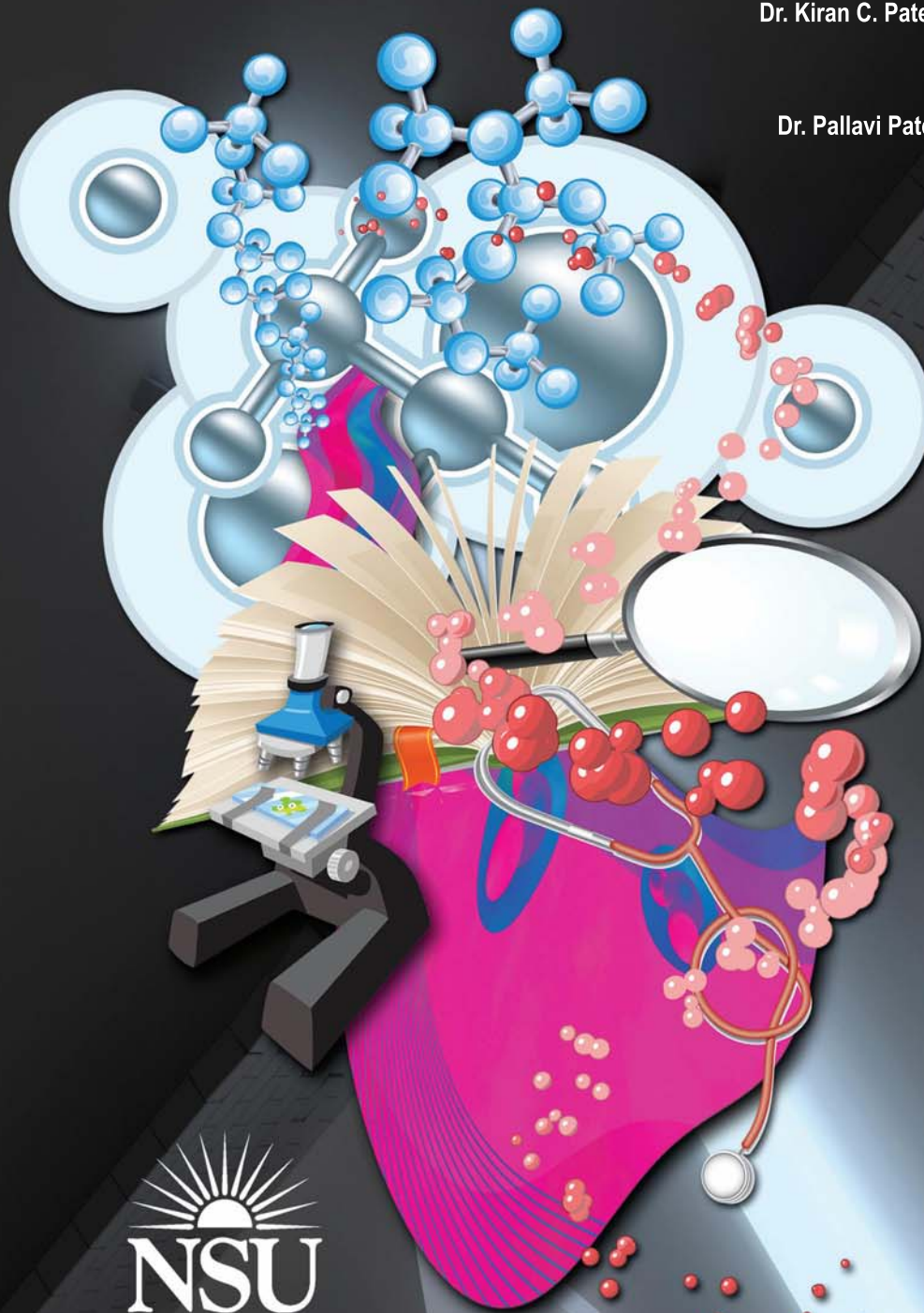
Dr. Pallavi Patel College of Health Care Sciences

College of Medical Sciences

College of Dental Medicine

College of Nursing

College of Allopathic Medicine



NOVA SOUTHEASTERN
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Health Professions Division

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Message from the founder of HPD Research Day, Dr. Fred Lippman

Today is indeed a proud day for Nova Southeastern University's Health Professions Division (NSU-HPD), because it marks the sixth important milestone in our evolution as a collaborative multidisciplinary and clinical research venue. In the 10 years since the inaugural HPD Research Day, NSU has continued to expand and develop into a fine example of what dedicated researchers can accomplish when given the support and encouragement of their institution.

Thanks to the proactive nature of Dr. Patrick Hardigan, who chairs the HPD Research Committee, the committee agreed it would be an excellent opportunity to create a showcase for student and faculty involvement in what NSU traditionally calls scholarly activity, much of which is actually research. Interestingly, many people view research as working in a laboratory and using test tubes and specialty equipment when the fact is research extends far beyond that restrictive definition. Our multidisciplinary researchers do some of the finest statistical and clinical research that can be found in the nation. This research is being conducted in an applied research lab using sophisticated research methodology and advanced statistical analysis techniques.

Before I continue, I would like to thank and acknowledge the HPD Research Day Committee members who have been working so diligently to ensure the project's success. They are Dr. Alison Bested, Dr. Stefanie Carter, Dr. Debra Dixon, Dr. Peter Gannett, Dr. Cristina Garcia-Godoy, Dr. Vanessa Johnson, Dr. Harvey Mayrovitz, and Dr. Julie Rodman.

Research Day allows our talented students to be present at one place at the same time so they can participate in and view various poster presentations as well as attend multiple discussion groups. This project has proven to be a truly time-consuming undertaking, so I commend the wonderful commitment of our deans and various program leaders who have allowed us to move forward with this multidisciplinary interchange in the area of research and scholarly activity.

Although it's impossible to predict the outcomes that will be realized in the weeks and months following Research Day, I have no doubt our students will be vastly enriched by the experience. I believe they will come away with a realization of the importance of research in the formative accumulation of knowledge individuals go through regardless of what HPD program they're participating in here at NSU.

I'm proud to say we've come a long way in a relatively short period of time. We now have multiple numbers of well-known and respected academic researchers in our institution that encompass the health professions spectrum, the Center for Collaborative Research is Florida's largest wet research laboratory, and the addition of the College of Allopathic Medicine will continue NSU's tradition of excellence in health care education.

Now that we've demonstrated our capabilities and showcased our acumen and research prowess, it's become apparent that we're viewed from a more-esteemed perspective than ever before. Thank you for your participation.

Sincerely,



Fred Lippman, R.Ph., Ed.D.
Interim Executive Vice President / Chief Operating Officer



Welcome to HPD Research Day

February 16, 2018

The Health Professions Research Division is excited to welcome you to Nova Southeastern University's Health Professions Division Research Day (HPD Research Day). All eight academic colleges of the Health Professions Division—Allopathic Medicine, Dental Medicine, Health Care Sciences, Medical Sciences, Nursing, Optometry, Osteopathic Medicine, and Pharmacy—have banded together to offer poster displays and oral presentations of their current research.

Research Day reflects the important contributions to NSU's mission as it relates to academic excellence, intellectual inquiry, leadership, research, and commitment to community through engagement of students and faculty members in a dynamic, life-long learning environment. This is an opportunity to learn about the research that our faculty, residents, fellows, and graduate students have conducted as a critical part of their educational experience.

Adding to the festivities will be door prizes and awards for best student presentations. People from other colleges across NSU will visit our division to learn more about us and see the work we do here. Students and faculty from all HPD's Regional Campuses will participate via videoconferencing. This event promises to be more than a day-long celebration of research and scholarly activities. It is also an opportunity for students and faculty from multiple disciplines to interact with each other and with the larger research and NSU communities. I am so pleased you are able to be a part of this academic research event.



Patrick C. Hardigan, Ph.D.
Director, HPD Research

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PLATFORM PRESENTATIONS

Auditoriums A, B, and UPP 113

Auditoriums A, B, UPP 113

10:15-10:45 a.m.

Millennial Nurse Manager Leadership Role Perspectives

Heather Saifman, Ph.D., Assistant Professor, College of Nursing, Nova Southeastern University

Objective. This study explored the experience of being a Millennial Nurse Manager; seeking to understand how these young nurse managers make meaning of their lived experience. **Background.** Little research is found in the literature on the experience of a being Nurse Manager and the relationship of those experiences informed by generational specifics (Saber, 2013). The American Association of Colleges of Nursing (AACN) (2016) contends meeting the challenge to transform care will require the successful leadership development, preparation, and role support of the next generation of nurse leaders. Identifying the leadership role expectations of young nurses serves to address many pressing succession planning needs. Through an increased understanding of factors and influences regarding the leadership trajectory of Millennial nurses; this research will inform current nurse leaders relative to strategies and evidenced based practice that could be aimed at developing the next generation of nurse leaders. **Method.** This was a qualitative interpretative phenomenological research study. A purposeful targeted national sample of 25 Millennial Nurse Managers, with a minimum of 1 year of nurse manager experience in the role, participated in audio-recorded telephone interviews. **Results.** Seven themes emerged from this study: Coming into the Role, Learning as I Go, Having the Support of My Director, Making an Impact, Helping Staff Succeed, & Managing Change. **Conclusion.** There are many opportunities to modify the role and to standardize the onboarding and development of these young leaders. **Grants.** No grant funding was obtained. **Videoconferencing:** Broadcast from Kendall to regional campuses, Auditorium A, B, and UPP 113.

Auditoriums A, B, UPP 113

10:45-11:15 a.m.

Travel. Experience. Grow - Service Learning and the BSN Nursing Student

Nicole Laing-Joseph, DNP, Associate Professor, College of Nursing, Nova Southeastern University

Service-learning for the Undergraduate Nursing student, provides the opportunity to gain practical skills, help communities, and allow the student the opportunity for self-reflection (Jarrell, Ozymy, Gallagher, Hagler, Corral, & Hagler, 2014). Service Learning for students at this level of their education encourages the opportunity for professional growth and insight into their cultural competence. Students rarely have the opportunity to leave their home country, to venture into other communities abroad, and completely immerse themselves in a culture while providing care to the population. Since the year 2000, the College of Medicine at Nova Southeastern University has conducted bi-annual mission trips to the island of Jamaica in June and December. Over the years this mission has grown to include the Colleges of Dentistry, Optometry, Physical Therapy, Occupational Therapy and Pharmacy. More recently in keeping with our mission of becoming “nationally and internationally recognized for preparing transformational leaders in health care who are valued for excellence in nursing practice, education, and research,” the College of Nursing has joined the mission to share in this opportunity to offer the Undergraduate student clinical experience in Caribbean populations. In the Summer of 2017, a team of 3 nursing faculty members along with nine nursing students took flight to Kingston, Jamaica to work shoulder to shoulder with their health professional counterparts in the primary role of health promotion and health education. This immersion in International services highlights the importance of service learning opportunities in improving cultural competency in the BSN nursing student. **Videoconferencing:** Presented live in Auditorium A.

Nurse Educators' Perceptions of Using High-Fidelity Simulation in Teaching

Marlene Whigham, Ed.D., Assistant Professor, College of Nursing, Nova Southeastern University

High-fidelity simulation in nursing refers to the use of computerized manikins to offer realistic hands-on training to nursing students. The problem addressed by this dissertation was resistance among some faculty to the use of new computerized simulation technology in the nursing curriculum. The research question for this case study investigated how faculty members can incorporate simulation into the curriculum and barriers faced in setting the stage for simulation experiences for their students. The goal of this applied dissertation study was to examine the perceptions of nurse educators regarding the benefits of and barriers to use of high-fidelity (computerized manikin) simulation with students in a university nursing program. Interviews were used in this qualitative case study to gather perceptions from educators in a university nursing program. The study was based on the qualitative research method with a case study design. The theoretical underpinnings for the study were concentrated within a constructivist framework. Twelve nursing educators were interviewed regarding their perceptions of the use of simulation in the nursing curriculum. The findings indicated that faculty believed the use of simulation to be beneficial to nursing students by increasing patient safety, improving students' critical thinking, improving learning outcomes, and increasing competency to transfer to clinical practice. Faculty recommended further training and technical support to maximize effective use of simulation. **Videoconferencing:** Broadcast from Kendall to regional campuses, Auditorium B, and UPP 113.

Improving Throughput, Teamwork, Productivity, and Patient Experience Using Lean Six Sigma Methodology

Violet Rhagnanan-Kramer, MSN, Ph.D. Nursing Student, College of Nursing, Nova Southeastern University

Objective. The purpose of this study is to share the outcomes and benefits of using Lean Six Sigma methodology to improve efficiency and cost effectiveness of the ICU workflow processes that increases staff engagement, productivity, teamwork and patient experience. **Background.** Lean and Six Sigma (LSS) methodologies were developed in the manufacturing industry to increase efficiency and eliminating waste. The method is aimed at seamlessly linking processes for time and cost saving while maintaining high quality. The Six Sigma five-step methodology is data driven. The LSS methodologies were implemented in the ICU to improve efficiency with throughput and productivity. The goal was to improve workflow and decrease the ready to move (RTM) time by 50%. **Methods.** Pilot and implementation ran for 38 days using a multidisciplinary team approach. A Charge Nurse/Physician Rounding Tool was developed and was used during rounding at 4pm, 10pm and 6am. Patients were identified for transfer and transfer orders were obtained. A Patient Transfer Checklist was created for nurses to anticipate, communication, and utilize the checklist to prepare the patient for timely transfer. **Results.** Results showed sufficient evidence at the alpha level of 0.05 indicating that the average Order to RTM Time is statistically significantly different compared to baseline. The RTM was decreased to 28 minutes generating a cost savings of \$89,107. **Conclusion.** Using the LSS method was an effective approach to increase cost savings, bed capacity, and productivity and decrease length of stay. Additional benefits included improved patient satisfaction, staff engagement, work standardization and efficiency. **Videoconferencing:** Presented live in Auditorium A.

Adolescents' Perceptions of School Safety: An Ethnographic Approach

Linda McCash, Ph.D., Associate Professor, College of Nursing, Nova Southeastern University

Objective. The purpose of this study is to describe the results of focus group discussions held with older adolescents' in high schools to explore their perceptions of school safety. Protective factors in the school environment have been conceptualized as countering adolescent exposure to risk and enhancing the experience of protection. **Background.** School violence, teasing and bullying have been identified as serious problems affecting a significant proportion of American youth (Stevens, Lynn, & Glass, 2001). Addressing problems of violence in schools traditionally include skills-building prevention, although researchers are increasingly recognizing the importance of the interaction between individuals and their environments. **Methods.** Focus groups were conducted in a southwest Florida urban city including high school juniors and seniors in seven high schools. The transcripts were coded and analyzed using Ethnograph software (Qualis Research, 2000) and themes were reported, in order of frequency. **Results.** The sample included a total of 66 adolescent participants that were 17 to 19 years old who volunteered to participate in this study. The most frequently reported themes related to school protective factors will be reviewed and examples of student quotes from transcripts will provide support for the themes identified. **Conclusion.** Focus groups provided a means for adolescents to express their views about social relationships with peer groups, friends, teachers and school administrators that are protective, even when exposed to school teasing, bullying on a daily basis. These protective factors in the school setting that are perceived as protective has relevance for the development of school programs that incorporate school protective factors to decrease negative adolescent outcomes. **Grants.** This study was partially funded by the Safe Schools/Health Students National Grant. **Videoconferencing:** Broadcast from Ft. Myers to regional campuses, Auditorium B, and UPP 113.

To Determine the Usefulness of the PainCQ-20 as a Measure of Interdisciplinary Pain Management Care Perception

Timothy D. O'Connor, Ph.D., Assistant Professor, College of Nursing, Nova Southeastern University

Objective. To examine a modified Pain Care Quality PainCQ-20 as a measure of interdisciplinary pain management care (IPMC) perception. **Purpose.** To determine the usefulness of the PainCQ-20 as a measure of sustained perception in IPMC among older nursing home residents with chronic pain. **Aims.** (1) to evaluate the content validity of the PainCQ-20 survey; (2) to examine the PainCQ-20 survey as a measure of sustained perception in IPMC; and (3) to determine if scores from the PainCQ-20 survey correlate with a resident's length of stay (LOS) while controlling covariates pain intensity, pain interference, depression, and anxiety. **Research design.** A test-retest for sustained repeatability with a convenience sample of residents from nursing homes in southern Florida. **Additional instruments for covariates.** (1) the Faces Pain Scale-Revised for pain intensity ratings, (2) the Brief pain Inventory for pain interference (3) the five-item Geriatric Depression Scale for depression, and (4) the Geriatric Anxiety Inventory for anxiety. Also, field notes will denote items that residents have difficulty with on the PainCQ-20. **Data analysis.** Content validity of the PainCQ-20 survey will be examined using descriptive content analysis to code field notes related to the PainCQ-20 survey. A paired sample correlation will be used on scores from the PainCQ-20. Also, PainCQ-20 scores will be compared to a resident's LOS, while controlling covariates using ANCOVA. **Potential significance.** The survey has the potential for being a useful quality improvement tool for identifying how nursing home residents perceive the quality of their pain management care. **Videoconferencing:** Broadcast from UPP 113 to regional campuses and Auditorium B.

**Change in Attitudes and Knowledge with Participation in an Interprofessional Education Experience
Between Nursing and Physical Therapy Students**

Sarah Koplw, Ph.D., Assistant Professor, College of Nursing, Nova Southeastern University
Bini Litwin, DPT, Ph.D., Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Shari Rone-Adams, DBA, Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Melissa Morris, MSN, Clinical Manager of Human Patient Simulation and Skills Lab, College of Nursing, Nova Southeastern University

Heather Hettrick, Ph.D., Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Lisa Soontupe, Ed.D., Associate Professor, College of Nursing, Nova Southeastern University
Archana Vatwani, DPT, Assistant Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Objective. The purpose of this study was to understand nursing and physical therapy students' attitudes and knowledge of the other discipline before and after participation in an inter-professional simulation experience.

Background. Collaboration among team members in an inter-professional environment is integral to patient safety, improving quality of care, and health outcomes. Bachelor of Science in Nursing (BSN) and Doctor of Physical Therapy (DPT) students from the same academic institution participated in inter-professional simulation experiences. **Methods.** Simulation activities included 1st year nursing students and 1st year DPT students using low fidelity role-plays of a patient with a wound and collaboration of 2nd year DPT students and 1st year nursing students using a high fidelity manikin and case scenarios to assess an acute medical patient. Students completed a pre-and post-test survey, which was an adapted version of the Readiness for Interprofessional Learning Scale. Students also completed a short answer questionnaire. **Results.** Over a two-year period, 186 students participated in the experience; 52 (28.4%) were nursing students and 131 (71.6%) were DPT students. The survey questions assessed the subscales of teamwork and collaboration, negative professional identity, and positive professional identity. Analysis using the Wilcoxon Signed Ranks test demonstrated significant positive change post-simulation. Short answer questions revealed participants perceived enhanced understanding of their colleagues' discipline, interest in future collaboration, and enhanced communication, among disciplines following the interaction. Most participants indicated preference for future interprofessional educational experiences. **Conclusion.** Participants demonstrated an increased appreciation for teamwork, collaboration and knowledge of each other's profession. **Grants.** N/A. **Videoconferencing:** Presented live in Auditorium A.

Improving Critical Thinking in Nursing Students

Camille Baldwin, Ed.D., Assistant Professor, College of Nursing, Nova Southeastern University

Objective. This study was designed to examine developing critical thinking processes in beginning nursing students and discover the preferred practices educators use to promote critical thinking development. **Background.** Researchers and educators agree critical thinking processes affect many facets of nursing and determine development of critical thinking processes begin early in nursing curricula. These facets include decision-making processes at point of care, evidence-based practice, positive work environments, increased retention rates and work performance, and patient outcomes. **Method.** For this study, a qualitative, single-embedded exploratory case study design for an intensive analysis of the perceptions of preferred practices in developing critical thinking processes in nursing students was utilized. Constructivism was used as the theoretical framework. Data was collected through focus group interviews. **Results.** The participants concurred that their preferred practices to develop critical thinking were case studies, concept maps, and simulations. In the literature review, researchers determined debating, gaming, group activities, presentations, questioning, and reflecting as best practices to develop critical thinking processes, in addition to case studies, concept maps, and simulations. Two unexpected discussions occurred in the faculty focus group session. First, faculty were discussing standardized examination questions to evaluate critical thinking processes. The second unexpected discussion was regarding how critical thinking is defined. **Conclusion.** According to these results, active, student-centered learning experiences improve critical thinking. These experiences should begin when the student first enters the nursing program. **Grants.** None. **Videoconferencing:** Broadcast from Ft. Myers to regional campuses, Auditorium A, B, and UPP 113.

End of Life Care: Cost Versus Care, When Do We Stop?

Lori A. Lupe, DNP, Associate Professor, College of Nursing, Nova Southeastern University

The practice of critical care is frequently full of ethical and spiritual conflict. As Associate Chief Nursing Officer in an academic hospital we were frequently challenged with the challenges when is care futile, and are we doing what is in the best interest of patients. Families are frequently asked to make complex decisions regarding care of their loved ones in crisis situations. Many times they do not understand the complex words, treatments, and choices and the long term impact of the decisions made in that emotional time. As healthcare providers we are caught between what we “can do” versus what we “should do” and where will the patients and families access the resources to deal with long term life-sustaining machines, complex care needs, and services. I have talked with numerous families who were forced to make complex decisions about complicated care under extreme emotional exhaustion and fear who later talked about “if I had only known it would be like this” would have made alternative decisions. The purpose of this presentation would be to discuss these situations along with relevant review of the literature to facilitate discussion and explore how to help navigate the experience of end of life care. Are we really helping? And how do we know? **Videoconferencing:** Broadcast from Ft. Myers to regional campuses, Auditorium A, B, and UPP 113.

Hull Auditorium

Hull Auditorium

10:45 – 11:15 a.m.

Longitudinal Study of Efficacy of Retreatment and Duration of Visual Improvements Following Transcorneal Electrical Stimulation in Three Individuals with Retinitis Pigmentosa

Kenneth R. Seger, MS, OD, Associate Professor, College of Optometry, Nova Southeastern University

Ava K. Bittner, PhD, Associate Professor, College of Optometry, Nova Southeastern University

Objective. A small-scale randomized controlled trial conducted by our group found that four of seven retinitis pigmentosa (RP) subjects who received six weekly Transcorneal Electrical Stimulation (TES) sessions developed significant improvements in visual acuity (VA), quick contrast sensitivity function (qCSF), and/or Goldmann visual fields (GVF). We longitudinally monitored three of these participants for declining visual function due to natural RP progression to determine the duration of their responses and administered retreatments. **Background.** Retinitis Pigmentosa is a hereditary ocular disease that leads to restricted visual fields and night blindness. It has been resistant to any treatments which might mitigate the effects of the disease. The initial experience with TES has shown encouraging results. **Methods.** Over a period of 29-35 months, repeated ETDRS VA, qCSF and/or GVF tests and three to six TES treatment courses consisting of six weekly sessions were administered in each eye of three RP participants every four to 16 months in an unmasked, prospective case series study. **Results.** For two participants, there were significant VA improvements of 44-52 letters (0.88-1.04 logMAR) and 15-23 letters (0.3-0.46 logMAR) in the worse eye at baseline after each of three or four treatment courses of TES compared to initial baseline. They had no significant decreases from baseline for VA or qCSF over 29 to 35 months. The third participant had a significant mean improvement in VA in the eye with better baseline vision ($p=0.004$) and binocularly (p .

Conclusion. Following encouraging visual improvements after TES that lasted for several months, it appears it may be possible to restore and prevent slowly diminishing vision over time with retreatments, which requires confirmation in a large-scale randomized controlled trial.

Hull Auditorium

11:15 – 11:45 a.m.

Feasibility of Using Bluetooth Beacon Sensors to Detect Magnifier Usage by Low Vision Patients in Clinic and at Home

Ava K. Bittner, Ph.D., Associate Professor, College of Optometry, Nova Southeastern University

Rakin Khan, Halmos College, Nova Southeastern University

Objective. Bluetooth beacons were evaluated as an indicator of held-held optical magnifier use during reading by low vision patients. **Background.** Bluetooth low energy beacons are an emerging, novel technology involving tiny sensors that collect real-time continuous, objective data, which might help ascertain the abandonment of low vision devices (magnifiers) in a timely manner to prompt a follow-up evaluation to resolve any issues. **Methods.**

Temperature and/or humidity data were recorded by Estimote and BlueMaestro™ beacons that we attached to the handle of optical magnifiers used to help with reading by low vision patients in clinic ($n=13$) and at home ($n=3$).

Results. In the clinic, patients whose hand/fingers made direct vs. indirect contact with Estimote beacons had greater temperature increases on average from baseline after 30 seconds (0.68°C vs. 0.26°C), 60 seconds (1.02°C vs. 0.35°C), 90 seconds (1.39°C vs. 0.54°C), 105-120 seconds (1.54°C vs. 0.62°C), and 135-150 seconds (2.07°C vs. 0.8°C). During magnifier usage at home, the BlueMaestro™ beacon measured rapid increases in temperature (5.6°C per minute on average; range 2.7-7.3°C) and humidity (19.4% per minute on average; range 8.7-34%). Humidity tended to reach its maximum increase and return back to baseline more quickly than temperature. All increases during magnifier usage were much greater than the maximum room fluctuations without use (clinic: 0.2°C over 120 seconds; home: 0.6°C and 2.4% over 1 minute). The beacons were non-intrusive and acceptable by patients.

Conclusions. Estimote and BlueMaestro™ beacons can reliably detect temperature and humidity increases when held by low vision patients while reading with a magnifier.

Juvenile Open-Angle Glaucoma: A Case Comparison

Heather R. Gauger, OD, College of Optometry, Nova Southeastern University

Introduction. Juvenile open-angle glaucoma typically occurs between the ages of 5 to 35 and patients are often asymptomatic with IOP of 30 mm Hg or higher. **Case Presentation.** Comparing and contrasting a classic case of juvenile open-angle glaucoma with an atypical case. Case 1: 13 year old Hispanic female with elevated IOPs, nerve fiber layer defects in the left eye with corresponding visual field defects as well as loss of nerve tissue in the left eye. The patient's pachymetry proves to be thicker than average and angles are open. Case 2: 15 year old African American female with normal IOPs, abnormal nerve fiber layer defects in the right eye with corresponding loss of nerve tissue. The patient has normal corneal thickness and angles are open. Her visual fields are unreliable in both eyes. **Deviation From the Expected.** It is very unusual to have normal IOPs in cases of juvenile open-angle glaucoma, thus for case 2 secondary causes must be ruled out. **Discussion.** Case 1: IOP lowering medications were indicated. The patient will be followed up with IOP checks, visual fields, photos and OCTs. Case 2: Follow-up with repeat visual fields and IOP check. Secondary causes must be ruled out. Consult with pediatric glaucoma ophthalmologist, neuro-ophthalmologist, and patient's PCP. Consider an MRI for completeness. **Conclusion.** Juvenile open-angle glaucoma can result in significant visual loss if not caught and treated early. These patients tend to present in a classical manor. When a young patient presents with nerve damage consistent with glaucoma yet normal IOP ranges, secondary causes must be ruled out.

Case Series: Effective Use of Microperimetry

Samantha Kayser, OD, College of Optometry, Nova Southeastern University

Introduction. Microperimetry is an ophthalmic diagnostic tool that correlates visual sensitivity to the exact anatomic location on the retina. While primarily used in visual rehabilitation and research, the cases presented also elucidates practical applications for primary care optometry. **Case presentation.** Case reports of two patients with unusual visual fields will be presented. The first patient is a 70 year old african-american female with a history of visual impairment following a CVA. The second is a 78 year old caucasian female referred for a low vision assessment status post cataract surgery that did not successfully improve visual acuity. **Deviation From the Expected.** This report will discuss unusual visual field deficits in patients with visual impairment and how to quantify them using microperimetry. It will also highlight how this information can be used in patient management. **Discussion.** The microperimeters uniquely customizable visual field program and its ability to correlate visual sensitivity to anatomic location helped gain insightful case information currently unattainable by other diagnostic tools. This data was used to guide patient management strategies. **Conclusion.** With recent advances in technology, there is increasing evidence supporting the utility of microperimetry as a clinical diagnostic tool and research instrument.

Systemic Diseases and Double Vision in Adults

Janice Hui, OD, College of Optometry, Nova Southeastern University
Lang Woodmansee, College of Optometry, Nova Southeastern University

Introduction. Health care practitioners are often attuned to specific ocular anomalies associated with common systemic diseases. This case series describes less common presentations of patient with visual symptoms and systemic diseases not initially associated with their visual complaints. **Case presentation.** (1) A 55 year-old female presents with sudden onset double vision that began after being placed on medical therapies for arthritis and severe migraines. (2) An 18 year-old female reports debilitating blur and double vision unresponsive to traditional spectacle correction after being diagnosed with Celiac Disease and Ehlos Danlos Syndrome. (3) A 59 year-old female with borderline diabetes and thyroid disease reports increasing frequency of double vision despite no new ocular findings. **Deviation From the Expected.** This case series highlights how frail systemic health can trigger a cascade of breakdowns in the visual system not commonly associated with the patient's systemic illnesses. **Discussion.** Systemic conditions can affect the visual system's ability to compensate for underlying binocular conditions. Ocular involvement in systemic diseases may be the only initial presenting symptom but it can also provide important information regarding disease activity. **Conclusion.** This series highlights for health care practitioners how the combination of fragile systemic health and unstable visual system can result in debilitating ocular symptoms. Additionally, the report will describe the specific visual breakdowns and present ocular management for these atypical cases. **Grants.** No grants or funding to disclose.

Marder Auditorium

Marder Auditorium

10:45 – 11:15 a.m.

Evaluation of Osteogenic Differentiation of PDLSCs Encapsulated in Self-Assembling Hydrogel Scaffold in the Presence of BMP-2

Karen Ben-Elazar, BA, D3, College of Dental Medicine, Nova Southeastern University

Alireza Heidari, Ph.D., College of Dental Medicine, Nova Southeastern University

Nicole DeLorenzo, BS, College of Dental Medicine, Nova Southeastern University

Jerry T. Ennolikara, Halmos College of Natural Sciences and Oceanography, Nova Southeastern University

Umadevi Kandalam, Ph. D., Associate Professor, College of Dental Medicine, Nova Southeastern University

Objective. To investigate optimal BMP-2 concentration to enhance osteogenic differentiation of periodontal ligament derived stem cells (PDLSCs) embedded in PuraMatrix™ hydrogel. **Background.** Bone Morphogenic Protein-2 (BMP-2) provides the primary signal specifically targeting progenitor cells to stimulate production of osteoblasts and promote mineral deposition. PuraMatrix™, a nanofiber hydrogel scaffold, promotes cell growth and provides sufficient porosity for adequate nutrient diffusion within the hydrogel suspension, mimicking in vivo conditions. It is hypothesized that PuraMatrix™ encapsulated PDLSCs stimulated with BMP-2 accelerates osteogenic differentiation. **Methods.** Cell proliferation was measured by WST and live-dead cell assays. Osteogenic differentiation of PDLSCs in hydrogel supplemented with 50, 100, and 200ng/ml of BMP-2 for one week was measured through a pNPP assay and quantitative PCR analysis for ALP and RUNX2 gene expression. **Results.** Live dead cell assay of PDLSCs encapsulated in PuraMatrix™ induced with BMP-2 demonstrated that cells were viable at all concentrations observed. A dose dependent increase in the ALP activity was observed in treated cells. PCR analysis demonstrated a significant increase in the ALP and RUNX2 gene expressions at all concentrations. ALP levels significantly increased in cells treated with 50ng/ml compared to 200ng/ml BMP-2 and no significant difference between 100ng/ml and 200ng/ml BMP-2 groups. These results suggest accelerated osteogenic differentiation of PDLSC's with increased BMP-2 dosages. **Conclusions.** These findings can be implicated towards use of this BMP-2 mediated cell-scaffold-system in craniofacial bone tissue engineering. **Grants.** This study was funded by a grant from FloridaBlue.

Marder Auditorium

11:15 – 11:45 a.m.

RGD-Modified Alginate Scaffold Supplemented with BMP2 Supports Osteogenic Differentiation of Periodontal Ligament Derived Stem Cells (PDLSCs)

Alireza Heidari, Ph.D., Research Lab Assistant II, College of Dental Medicine, Nova Southeastern University

Nicole DeLorenzo, BS, Research Lab Technician I, College of Dental Medicine, Nova Southeastern University

Umadevi Kandalam, Ph.D., Associate Professor, College of Dental Medicine, Nova Southeastern University

Objective. To develop in vitro injectable cell-growth factor-scaffold system and to assess osteogenic differentiation of (PDLSCs). **Background.** Multipotent stem cells derived from human periodontal ligament stem cells (PDLSCs) are able to promote the formation of bone tissue making this cells interesting candidate for craniofacial bone tissue engineering. RGD-coupled alginate is considered as promising scaffold for the capacity to mimic many functions of the extracellular matrices. Bone Morphogenic Protein-2 (BMP-2) is a potent growth factor, plays an essential role in osteogenic induction. Our hypothesis is that, the combination of BMP-2 to cells embedded within alginate beads scaffold, accelerates the osteogenic differentiation. **Methods.** Human PDLSCs was isolated and cultured using standard culture conditions. The cells were encapsulated in the alginate gels and their proliferation was measured. The PDLSCs in alginate beads were supplemented with 50, 100, and 200ng/ml of BMP-2. The activity of alkaline phosphatase was measured through a pNPP assay. The osteogenic differentiation of ALP, RUNX2 and COL1 gene expression was measured using quantitative PCR. **Results.** The WST demonstrated that PDLSCs were viable at all concentrations. Furthermore, the cells were viable until day7. The quantitative PCR results reported upregulation expressions in the ALP, and COL1 genes at all BMP2 concentrations with peak at 200ng/ml. **Conclusions:** BMP2 enhances the osteogenic differentiation. RGD modified alginate- BMP2- PDLSCs- system represents a promising source for bone tissue engineering. **Grants.** This study was funded by Florida Blue foundation grant # 333248.

Comparison of Pre-Cleaning Methods on the Sterilization and Microstructure of Dental Diamond Burs

Zeenat Khan, DDS, PG-Prosthodontics, College of Dental Medicine, Nova Southeastern University
Umadevi Kandalam, Ph.D., Assistant Professor, College of Dental Medicine, Nova Southeastern University
Jeffrey Y. Thompson, Ph.D., Professor, College of Dental Medicine, Nova Southeastern University
Sharon C. Siegel, DDS, Associate Professor, College of Dental Medicine, Nova Southeastern University

Objective. This study compared bacterial growth after autoclaving contaminated diamond burs pre-cleaned by four different methods. **Background.** Studies show autoclaving to be the most effective method to sterilize dental instruments including burs. It has been reported that autoclaving of diamond burs is not 100% effective. National guidelines require pre-cleaning prior to autoclaving but no studies compare pre-cleaning methods on sterilizing diamond burs. **Methods.** IRB approval was granted(2017-299). Twelve medium grit multiple-use diamond burs were used for testing of four pre-cleaning groups and 3 control groups for a total of 96 burs. These groups included positive controls, negative controls, single-use diamond controls and the four research groups. Each bur was contaminated by preparing one tooth per patient. In groups of 12, the burs were pre-cleaned by either manual scrubbing, ultrasonic, diamond cleaning stone, or steam cleaning. The pre-cleaned burs were autoclaved at 270° F for 35 minutes. They were placed in sterile tubes filled with Brain Heart Infusion broth under aseptic technique at 37° C for 72 hours. The presence of bacterial growth was assessed by measuring the absorbance values. Microstructure analysis was performed using Scanning Electron Microscopy (SEM). **Results.** After autoclaving, no bacterial growth was observed in any group. SEM studies demonstrated that diamond burs pre-cleaned by manual scrubbing removed the diamond chips. **Conclusions.** All pre-cleaning methods were equally effective in showing complete sterilization of diamond burs. Manual scrubbing of diamond burs is not recommended since it results in a compromised instrument. **Grant.** Funded by the HPD Research Grant (035067).

A Novel Cell Therapy via Direct Reprogramming of Human Fibroblasts into Functional Osteoblasts for Bone Regeneration

Kenta Yamamoto, Ph.D., College of Dental Medicine, Nova Southeastern University
Toshihisa Kawai, DDS, Ph.D., College of Dental Medicine, Nova Southeastern University

Objective. Osteoblasts (OBs) play a central role in osteogenesis. It is thought that autologous somatic stem cells or iPS cells represents the sufficiently efficient bone regenerative therapy. This approach is, however, limited by the number of available authentic stem cells as well as cost- and time-consuming procedures. In this study, we developed a novel method of directly reprogramming human fibroblasts which are abundantly available from patients into functional OBs. **Methods.** Normal human fibroblasts were transfected with a panel of selected genes using retroviral vectors or polycistronic plasmid vector, and then cultured in osteogenic medium. The resultant cells were tested in vitro for expressions of OB-specific genes, the production of calcified bone matrix, and the epigenetic status of the cells. To assess in vivo function, the reprogrammed OBs were transplanted to the bone defect generated in immune-deficient mice. **Results.** Gene-transfection of fibroblasts using retroviral vector induced osteocalcin- and ALP-positive OB-like cells which produced mineralized bone matrix at high efficiency, while polycistronic plasmid vector showed modest efficiency. Such reprogrammed OB-like cells demonstrated distinctly different methylation status from original fibroblasts, while displaying the gene-expression profile similar to normal OBs. Directly reprogrammed OBs, further, facilitated sufficient bone regeneration in vivo. These results suggest the direct transformation of fibroblasts can generate functional OBs. **Conclusion.** We developed a novel technique to directly reprogram human somatic cells, i.e., fibroblasts, into functional OBs by transfection with defined genes, offering an alternative cell therapy for bone regeneration in some patients, e.g. elderlies, who have limited number of stem cells. **Grants.** NSU HPD grant, Osteology foundation research grant.

Connecting the Pieces: An Appreciative Inquiry of a Didactic Training Module for Pediatric Dentistry Residents Treating Children with ASD and Their Families

Jennifer Denine Chung, LMFT, Ph.D. student, College of Dental Medicine, Nova Southeastern University
Maria A. Levi-Minzi, M.A., College of Arts, Humanities, and Social Sciences, Nova Southeastern University
Romer Ocanto, DDS, Professor, College of Dental Medicine, Nova Southeastern University
Anne Rambo, Ph.D., Professor, College of Arts, Humanities, and Social Sciences, Nova Southeastern University

Objective. The purpose of this study is to understand the impact of a didactic training curriculum for pediatric dentistry residents in the care of children with ASD; specifically, the aspects of the curriculum that allowed the residents to provide a higher quality of care to these patients. **Background.** Children with ASD face numerous barriers to accessing and receiving quality healthcare. Dental care in particular has been found to be an unmet healthcare need among children with ASD due to poor perceived behavior, and a lack of trained dental professionals proficient in treating this specialized group. **Methods.** Data for this study were collected from a grant awarded to NSU aimed at training pediatric dentistry residents to work with families who have a child diagnosed with ASD. Residents who participated in the clinical and didactic training program attended focus groups to identify aspects of the trainings that may have changed their practice with children with ASD. Appreciative inquiry was the chosen method for qualitative analysis. **Results.** Preliminary data revealed that techniques and tools for use in the dental clinic learned during didactic and clinical trainings helped residents to provide the best care to patients with ASD. In addition, involving the parent in the treatment planning process was critical in obtaining more favorable outcomes. **Conclusion.** Preliminary findings provide insight into the curriculum's potential influence on clinical practices utilized in the treatment of children diagnosed with ASD, shedding light on what works for medical providers in the care of a child with ASD. **Grant.** Grant Number D88HP20126

Melnick Auditorium

Melnick Auditorium

10:45 – 11:15 a.m.

Comparative Effectiveness of Venous Thromboembolism (VTE) Prophylaxis in Patients with Cancer

Omar A. Almohammed, PharmD, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University
Leanne Lai, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. To evaluate the safety and effectiveness of anticoagulants used for thromboprophylaxis in cancer patients. **Background.** Cancer patients account for 20% of all VTE cases in the United States, and VTE has a more substantial effect on cancer patients than on non-cancer patients. Despite many clinical practice guidelines, the anticoagulant's effectiveness still remains controversial in cancer patients. **Methods.** A retrospective comparative effectiveness cohort study was conducted using data from the Medical Expenditure Panel Survey. The incidence of VTE, bleeding, and all-cause death events; and health-related quality of life were used as outcomes to evaluate the two cohorts (prophylactic and matching-control). The effects of age, gender, race, and comorbidities on the clinical outcomes were controlled in logistic regression. **Results.** The incidence of VTE was higher in the prophylactic cohort than the matching-control (5.6% vs. 2.1%, respectively, with a relative risk (RR) of 2.66, 95%CI 2.64-2.68). Furthermore, there were more bleeding (29% vs. 24%, RR 1.21, 95%CI 1.21-1.22) and all-cause death events (10.13% vs. 6.86%, RR 1.47, 95%CI 1.46-1.48) in the prophylactic cohort than in the matching-control cohort. However, after controlling for the effect of age, gender, race, and comorbidities these differences between the two cohorts became statistically insignificant. The use of thromboprophylaxis was associated with a significant decline in physical quality of life, with no significant impact on mental quality of life. **Conclusion.** The present study findings support the current guidelines' recommendation pertaining to VTE prophylaxis in cancer patients by providing evidence on the anticoagulants' effectiveness for thromboprophylaxis in real-world practice.

Melnick Auditorium

11:15 – 11:45 a.m.

DNA Nucleotide Excision Repair in Ductal Carcinoma In Situ

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Jean Latimer, Ph.D., Associate Professor, College of Pharmacy, Nova Southeastern University
Stephen Grant, Ph.D., Project Director, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University
Stefanie Sveiven, Research Assistant, College of Pharmacy, Nova Southeastern University

Objective. To identify which Ductal Carcinoma In Situ (DCIS) cases will remain indolent versus those will become invasive. **Background.** DCIS is a non-obligate precursor of invasive breast cancer (BC). 50% of cases progress to invasive BC with no accurate way to identify indolent versus aggressive types. We hypothesized that isolation of invasive cells from 2 pre-existing DCIS cell lines will allow for the identification of biomarkers for invasive and non-invasive DCIS. We further hypothesize that NER is the engine for invasion evolution, leading to DCIS progression to stage I disease. **Methods.** Using a novel tissue-engineering system, DCIS model systems with isogenically matched contralateral or non-tumor adjacent (NTA) tissues were created. Expression microarray and RNAseq are being used to determine the expression of 20 canonical NER genes. The Unscheduled DNA Synthesis (UDS) assay is being used to determine NER capacity. **Results.** A comparison of NER capacity of DCIS explants with the isogenically matched contralateral and NTA explants show a reduction in NER capacity in DCIS. NER capacities reflect a continuum of high repair in contralateral falling lower in non-tumor adjacent and the lowest repair in the isogenic DCIS. Supervised analysis reveals that DCISs clustered together with non-disease breast reduction epithelium while DCIS synchronous with stage I BC clustered together with stage I and II BC. **Conclusion.** This study will differentiate between indolent and aggressive DCIS cases. Ultimately, these data and that of other laboratories will improve DCIS management.

Development of a Novel Radioligand for Characterization of the Mas Receptor for Angiotensin 1-7

Robert Charles Speth, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Hong Weng Pang, College of Pharmacy, Nova Southeastern University

Christopher T. Neagra, Palmetto General Hospital, Hialeah, FL

Samantha Bergoine, College of Pharmacy, Nova Southeastern University

Andrea Linares, College of Pharmacy, Nova Southeastern University

Filipe F. Stoyell-Conti, College of Pharmacy, Nova Southeastern University

Objective. To use radioligand binding to characterize Mas receptor binding in tissue. **Background.** Mas is the receptor for angiotensin 1-7 (Ang 1-7), however, no studies have characterized Mas receptor radioligand binding in tissue membranes. While the presence of a single iodine-125 molecule on the tyrosine of AngII does not impair its binding to the AT₁ and AT₂ receptors, it is not known whether iodine-125 on the tyrosine of Ang 1-7 is equally innocuous. **Methods.** To address this question, we prepared a novel analog Tyr⁰-Ang 1-7, to provide an alternate site for radioiodination of Ang 1-7. Tyr⁰-Ang 1-7 was radioiodinated using chloramine T (Hunter and Greenwood, 1962) with a 7-times excess of peptide to iodine to minimize di-iodination of the peptide. Two radioiodinated peaks, presumed to be mono ¹²⁵I-Y⁰-Ang 1-7 and mono ¹²⁵I-Y⁴-Ang 1-7, were resolved from uniodinated peptide by HPLC (C₁₈ reverse phase column, 14.5% acetonitrile:triethylamine phosphate, pH 3.0 mobile phase). Saturation radioligand binding assays were run for both peaks using rat liver membranes ± 10 μM Ang 1-7. **Results.** Both ¹²⁵I-Y-Ang 1-7 peaks displayed high affinity, saturable binding to rat liver membranes: early peak: K_D=7.7±2.3 nM, B_{max}=3.3±0.72 fmol/mg wet weight; and late peak K_D=11±2, B_{max}=3.6±0.4 fmol/mg wet weight. **Conclusion.** These results suggest that addition of a tyrosine at the amino terminus of Ang 1-7 increases its binding affinity for Mas and that the presence of an iodine-125 on either Y⁰ or Y⁴ of Ang 1-7 does not preclude high affinity, saturable binding to Mas.

GRK5 Protects the Heart Against Excessive Aldosterone by Phosphorylating and Inhibiting the Cardiac Mineralocorticoid Receptor

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Shelby L. Wertz, College of Pharmacy, Nova Southeastern University

Katie Anne McCrink, College of Pharmacy, Nova Southeastern University

Jennifer Maning, College of Pharmacy, Nova Southeastern University

Objective. To study the role of GRK5 in cardiac MR regulation. **Background.** Aldosterone (Aldo) is one of several increased cardio-toxic hormones in chronic heart failure (HF), contributing to its morbidity & mortality. Most of Aldo's cardiotoxic effects are mediated by the mineralocorticoid receptor (MR). G protein-coupled receptor (GPCR)-kinases (GRKs) are a family of seven serine/threonine kinases that primarily phosphorylate and desensitize GPCRs. GRK2 and GRK5, the most abundant GRKs in the heart, are also known to phosphorylate non-GPCR substrates. The MR is known to get phosphorylated at various serines, which diminishes its capacity to either translocate to the nucleus or to activate transcription (inhibitory phosphorylation). **Methods.** We used the cardiomyocyte cell line H9c2 and adult rat cardiomyocytes. We performed co-immunoprecipitation experiments for GRK interactions with MR. We measured MR phosphorylation via western blotting and MR transcriptional activity via the luciferase reporter assay. We also measured cellular apoptosis via TUNEL. **Results.** GRK5, but not GRK2, phosphorylates the MR in H9c2 cardiomyocytes. This effect is constitutive and is enhanced by beta2-adrenoceptor (but not beta1-adrenoceptor) stimulation. The GRK5-phosphorylated MR is incapable of activating gene transcription in cardiomyocytes, since MR transcriptional activity is markedly suppressed upon GRK5 overexpression. Conversely, CRISPR-mediated GRK5 gene deletion augments cardiac MR transcriptional activity. Finally, GRK5 is absolutely necessary for the anti-apoptotic effects of the MR antagonist drug eplerenone in cardiomyocytes. **Conclusions.** GRK5 blocks the cardio-toxic MR-dependent effects of Aldo. Thus, cardiac GRK5

stimulation with a beta2-adrenoceptor agonist may boost MR inhibitor therapy for severe chronic HF treatment.
Grants. NSU`s PFRDG FY17 #335408

Melnick Auditorium

2:45 – 3:15 p.m.

Effectiveness of Kingdomality for Measuring CAPE Outcomes

Robb McGory, PharmD, Associate Professor, College of Pharmacy, Nova Southeastern University
Graciela M. Armayor, PharmD, Assistant Professor, College of Pharmacy, Nova Southeastern University
Rochelle Nappi, Ed.D., Assistant Dean of Operations, College of Pharmacy, Nova Southeastern University

Objective. To determine if Kingdomality profiling can detect student maturation within CAPE Outcome domains.
Background. Pharmacy accreditation standards include CAPE educational outcomes. Measuring Domain 4, Personal and Professional Development has proved challenging. Kingdomality profiling may be sensitive to student change. **Method.** Students determined Kingdomality role at the beginning and end of the P1 year. Students were assigned to teams of balanced roles to collaborate on assignments and reflections involving practice, leadership, professionalism and co-curricular activities. Each role was assigned a number from 1 to 12, similar to a clock face, and correlated to 1 of 4 Kingdomality quadrants based upon the interrelationships of the roles. The number of students profiled into each role and quadrant was calculated. Individual change in roles was determined by change in assigned number. **Results.** 251 students were profiled. The number of students in each category remained relatively constant. White Knight (40%) Dreamer Minstrel (21%) and Shepherd (15%) were most prevalent roles in both testing periods, resulting in a dominant emotional helper quadrant (76%). Roles with leadership or critical thinking qualities were low (Benevolent Ruler 0%, Scientist 0%, Engineer Builder 1%). 145 (58%) students changed their role during the year. 49% of all students changed by a single clock position, 13% changed by 2, 6% changed by 3, 3% changed by 4, 10% changed by 5 and 19% changed by 6. **Conclusion.** Kingdomality roles remains constant within the entire population, but individual students evolved their roles. Kingdomality may detect changes in CAPE Outcomes. **Grants.** None

Morris Auditorium

Morris Auditorium

10:45 – 11:15 a.m.

Effect of Ovariectomy on Brain Angiotensin Type 1 Receptor Binding, Blood Pressure, and Hippocampal Gene Methylation and BDNF mRNA Expression in Dahl Salt-Sensitive Hypertensive and Dahl Salt-Resistant Normotensive Rats

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Hong Weng Pang, College of Pharmacy, Nova Southeastern University
Andrea Linares, College of Pharmacy, Nova Southeastern University
Natasha Rose, Nova Southeastern University
Tulsi Patel, Nova Southeastern University
Amrita Pai, Georgetown University
Aline Arlindo de Souza, Georgetown University
Emma J. Pollner, Georgetown University
Crystal A. West, Georgetown University
Malav S. Trivedi, Ph.D., Assistant Professor, College of Pharmacy, Nova Southeastern University
Hong Ji, Georgetown University
Kathryn Sandberg, Georgetown University

Objective. To assess the importance of gonadal steroids for blood pressure regulation, brain AT₁ receptors, and regulation of gene expression in the hippocampus of a hypertensive and normotensive rat strain. **Background.** Women's resistance to hypertension and cardiovascular disease prior to, but not after menopause, arises from ovarian hormones. Post-menopausally, women are more susceptible to cognitive impairment and dementias. The brain angiotensin system plays a role in cognitive function in addition to regulating the cardiovascular system. **Methods.** AT₁R binding was determined autoradiographically in selected brain regions of ovariectomized versus sham-operated (at 13-weeks) Dahl salt-sensitive (DS) and Dahl salt-resistant (DR) rats which were sacrificed at 33-weeks. Hippocampal DNA methylation was assessed by ELISA, while BDNF mRNA expression was determined by PCR. Mean arterial blood pressure (MAP) was determined telemetrically (DSI technology) at 29-weeks. **Results.** The MAP of DS sham rats was 181±5mmHg while the MAP of DR sham rats was 96±4mmHg (p1R expression in the solitary tract nucleus of the DS-OVX rats was significantly reduced (p **Conclusion.** Strain differences and gonadal functionality have limited effects on brain AT₁R expression. The global DNA methylation and BDNF mRNA changes suggest gonadal hormone and strain-specific alterations in gene expression in the hippocampus. **Grants Funding.** NIH NHLBI HL121456, HPD Research Grant, Cardiovascular Neuroscience Fund. **Videoconferencing:** Broadcast from Morris Auditorium to regional campuses.

Morris Auditorium

11:15 – 11:45 a.m.

The Impact of Antidepressants Use on Mental Healthcare Use

Ammena Binsaleh, MS, PhD(c), Ph.D. student, College of Pharmacy, Nova Southeastern University
Alexandra Perez, PharmD, Associate Professor, College of Pharmacy, Nova Southeastern University
Silvia Rabionet, Ed.D., Associate Professor, College of Pharmacy, Nova Southeastern University
Ioana Popovici, Ph.D., Associate Professor, College of Pharmacy, Nova Southeastern University

Objective. To determine whether patients with type 2 diabetes on antidepressant treatment were being monitored by a mental health professional (MHP). **Background.** Depression often occurs co-morbidly with diabetes; however, it is often unrecognized and undertreated in nearly two-thirds of patients with both conditions. Studies that assess mental health treatment are limited. **Methods.** This retrospective study was a secondary data analysis of the cross-sectional National Health and Nutrition Examination Survey (2005-2014). It included adults with type 2 diabetes and mild to severe depression symptoms. The dichotomous outcome was whether patients had seen a MHP (e.g., psychologist or psychiatrist) in the last 12 months. Sociodemographic, clinical, and behavioral factors were compared among 2 study groups: those on an antidepressant and those on no treatment. Univariate and multivariate logistic regression analyses evaluated the association of antidepressant use and MHP monitoring. **Results.** 966

subjects met inclusion criteria and 33.2% were on antidepressants. Seventy-seven percent of patients on treatment had not been followed by a specialist. Univariate analysis determined that those using antidepressants were 7.11 times more likely to have seen a MHP (23% v. 8%, p **Conclusion.** Diabetes patients with depression symptoms are generally not being monitored by a MHP, unless they are receiving medications. However, the majority of those on medications are not regularly followed by a MPH. Monitoring by a MHP should be the standard of care regardless of medication use. **Videoconferencing:** Broadcast from Morris Auditorium to regional campuses.

Morris Auditorium

11:45 a.m. – 12:15 p.m.

Nucleotide Excision Repair Identifies Two Distinct Types of Non-Tumor Adjacent Breast in Sporadic, Non-Germline Breast Cancer

Manasi R. Pimpley, BS, Ph.D. in Pharmacy, College of Pharmacy, Nova Southeastern University

Jennifer M. Johnson, College of Pharmacy, Thomas Jefferson University Hospital

Stephen G. Grant, Ph.D., Project Director, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University

Jean J. Latimer, Ph.D., Associate Professor, College of Pharmacy, Nova Southeastern University

Objective. Establish molecular temporal scheme for changes leading to breast cancer using Nucleotide Excision Repair (NER) capacity of early stage tumors and their isogenically matched non-tumor adjacent (NTA) samples.

Background. Loss of DNA repair capacity leads to genomic instability, a hallmark of carcinogenesis. Sporadic stage I breast tumors are intrinsically deficient in their NER capacity relative to non-diseased breast, the regulation of which is thought to be primarily epigenetic. We previously identified two groups of NTA tissue explants based on their NER capacities as measured by the functional Unscheduled DNA Synthesis (UDS) assay. 25% of NTA had normal NER capacity, similar to that of BRE, but higher than their matched stage I tumors (High-Low pair), whereas 75% exhibited lower NER capacity relative to BRE and similar to the matched tumor (Low-Low pair). We hypothesized that epigenetic regulation of NER genes would explain these different types of NTA. **Methods.** The functional UDS assay was used to select cell line pairs established by the Latimer Lab's tissue engineering system, representing the two groups. Expression of 20 canonical NER genes was measured by microarray analyses and confirmed with RNA sequencing. **Results.** The expression pattern of NER genes was concordant with their NER capacity in both types NTA and tumors. RNA sequencing confirmed these findings. **Conclusion.** The NTA breast represents a preneoplastic stage in breast carcinogenesis. Two different types of NTA have been identified with regard to DNA repair. **Grants.** NSU's PFRDG (6/1/12–5/31/14), NIH R29 (PI: Jean Latimer), NSU's PFRDG (6/1/13-5/31/15). **Videoconferencing:** Broadcast from Morris Auditorium to regional campuses.

Morris Auditorium

2:15 – 2:45 p.m.

National Level Exploratory Analysis of Hospital Adverse Drug Events Using the ADE Action Plan as a Framework

Fatimah Sherbeny, PharmD, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Julie Lamoureux

Barry A. Bleidt, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. This study was conducted to provide a national level analysis of hospital adverse drug events (ADEs) related to anticoagulants, diabetes agents, and opioids. **Background.** Hospital ADEs comprised the largest category of adverse events with an estimation of one event per patient per day in hospital care. Based on national ADE data, three types of adverse events were common, clinically significant, preventable, measurable, and were selected as high-priority targets of the ADE Action Plan. The targeted medication classes were anticoagulants, diabetes agents, and opioids. **Methods.** This study was an exploratory, quantitative, retrospective analysis. The National Inpatient Sample database (NIS) was used to explore ADEs yearly number of events (events/year), and ICD-9 codes associated with ADEs were used to identify the study population. **Results.** The average national events/year of ADEs during 2009-2014 was 44,824/year for anticoagulants, 8,493/year for diabetes agents, and 31,545/year for opioids. However, the number of events/year varied based on patient demographics, payer type and the presence of different comorbidities. For instance, the national number of events/year was higher in Medicare patients among the three medication classes. Meanwhile, females had lower number of events/year due to anticoagulants and diabetes

agents, and a higher one for opioids related ADEs (19,450/year vs. 12,089/year). **Conclusion.** The national yearly number of events of hospital ADEs was highly associated with patients' factors. Prevention strategies should not be individualized based on the medication only, but on patient's factors as well. **Grants.** This study was partially funded by a grant from the Health Profession Division at NSU. **Videoconferencing:** Broadcast from Morris Auditorium to regional campuses.

Morris Auditorium

2:45 – 3:15 p.m.

A Dual Mechanism to Deter Intravenous Drug Abuse Using Crosslinked Anionic Polymers
Rand H. Ahmad, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University
Breana Caturano, College of Pharmacy, Nova Southeastern University
Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The objective was to evaluate the contribution of binding and swelling of two crosslinked anionic polymers (carboxymethyl starch, CMS; and carboxymethyl cellulose, CMC) in reducing the amount of free drug available for intravenous abuse in different extracting solvents. **Background.** CMS and CMC polymers can offer both swelling and binding properties in aqueous solutions. Binding to cationic opioid drugs and entrapping portion of the drug solution due to swelling are expected to significantly lower the amount of free drug available for injection. This study evaluated the contribution of the two mechanisms in total drug entrapment from drug solutions. **Methods.** CMS and CMC were mixed with Dextromethorphan HBr in 10.0 ml of common extracting solvents. Followed by centrifugation, the supernatant was measured for its volume and drug concentration (UV spectroscopy). The results were used to calculate the total drug entrapment, entrapment due to swelling and entrapment due to binding. **Results.** In most extracting solvents, drug entrapment due to binding with CMS and CMC were $\geq 25\%$ and $\geq 40\%$ higher than that due to swelling, respectively. In solvents containing ions, entrapment due to swelling was greater but not exceeding 15% and 5% for CMS and CMC, respectively. **Conclusion.** The binding is the primary contributor to total drug entrapment in all extracting solvents, except in those containing salts (sodium) and ionic moieties (carboxyl groups). **Grants.** This study was supported by NSU Grant 335081. **Videoconferencing:** Broadcast from Morris Auditorium to regional campuses.

Resnick Auditorium

Resnick Auditorium

10:45 – 11:15 a.m.

Oral Cancer Awareness and Knowledge Among Patients in a Florida Dental Clinic

Lina Maria Mejia, DDS, MPH, Assistant Professor, College of Dental Medicine, Nova Southeastern University
Angela Garcia, PharmD, MPH, CPh, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University

Gabriel Suci, MSPH, PhD, Associate Professor, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University

Aim(s). The purpose of this study was (1) to assess the level of the public awareness and knowledge about early signs, symptoms and risk factors of oral cancer among dental patients visiting Nova Southeastern University (NSU) Dental Clinic in Fort Lauderdale, Florida and (2) to correlate the awareness and knowledge levels according to age, gender, ethnicity, education levels and marital status. **Background.** Oral cancers cause more than 130,000 deaths each year. Even though an oral cancer screening can be performed easily and without discomfort for the patient; these survival statistics have not improved over the past decade. In addition, incidence rates are currently increasing in many places around the world, particularly among younger individuals (aged less than 45 years). **Methods.** This study used dental patients who presented for routine scheduled appointments at the NSU Dental Clinic. Data collection was conducted from April through July 2015 and participation was confidential. A self-administered 26-question instrument was used to assess awareness and knowledge about Oral Cancer and sociodemographic information. **Results.** Three hundred thirty-eight patients participated; 50.3% were males and 49.7% females. The ages ranged from 18 thru 70+, with the mean age 55.3 years. Of the respondents, 47.3% were white, 29.2% Hispanic and 17% African-American. Of the respondents, 48.8% did not know anything about the disease; 45.2% knew a little, and only 6% considered they knew a lot. **Conclusions.** Based on the information for this Cohort there is a significant lack of awareness and knowledge about signs, symptoms and risk factors of oral cancer in the general population.

Resnick Auditorium

11:15 – 11:45 a.m.

OC-STAMP Promotes Osteoclast Fusion for Pathogenic Bone Resorption in Periodontitis via Upregulation of Permissive Fusogen CD9

Toshihisa Kawai, Ph.D., College of Dental Medicine, Nova Southeastern University

Kenta Yamamoto, Ph.D., College of Dental Medicine, Nova Southeastern University

Alexandru Movila, Ph.D., Assistant Professor, College of Dental Medicine, Nova Southeastern University

Objectives. Multinuclear osteoclasts (OC) resulting from fusion between OC precursors plays a key role in bone resorption. Several cell-surface fusogens are involved in osteoclast cell-fusion, such as, CD9, osteoclast-stimulatory transmembrane protein (OC-STAMP) and dendritic cell-specific transmembrane protein (DC-STAMP). The object of this study was to elucidate the role of OC-STAMP in the OC-mediated pathogenic bone resorption using a mouse model of ligature-induced periodontitis. **Methods.** Effects of anti-OC-STAMP-neutralizing mAb on RANKL-induced osteoclastogenesis and cell fusion was monitored in vitro by TRAP-staining, while qPCR was performed for detection of CD9, OC-STAMP and DC-STAMP mRNAs. C57BL6/j mice that received ligature-attachment to the maxillary molar were treated with systemic administration of anti-OC-STAMP-mAb or control mAb, and level of periodontal bone loss and TRAP+ multinuclear OCs were monitored at Day-7. **Results.** Stimulation of mononuclear OC-precursors with RANKL in vitro induced cell fusion, whereas anti-OC-STAMP-neutralizing mAb down-modulated; 1) the emergence of large multinuclear TRAP+ OC cells, 2) pit formation and 3) mRNA and protein expression of CD9, but not DC-STAMP, in RANKL-stimulated OC-precursors. While anti-DC-STAMP-mAb also downregulated RANKL-induced osteoclastogenesis in vitro, it had no effect on CD9 expression. Systemic administration of anti-OC-STAMP-mAb to ligature-received mice, compared to control mAb, suppressed the alveolar bone loss along with the diminished expression of CD9 mRNA and reduced emergence TRAP+ multinuclear osteoclasts. **Conclusions.** The present study demonstrated that OC-STAMP is engaged in pathogenic

periodontal bone loss via upregulation of OC cell-fusion by upregulation of permissive fusogen CD9, but not DC-STAMP, suggesting that OC-STAMP/CD9 axis induces periodontal bone loss.

Resnick Auditorium

11:45 a.m. – 12:15 p.m.

Macrophage Migration Inhibitory Factor (MIF) Supports Homing of Osteoclast Precursors to Peripheral Osteolytic Lesions

Alexandru Movila, Ph.D., Assistant Professor, College of Dental Medicine, Nova Southeastern University
Toshihisa Kawai, DDS, Ph.D., College of Dental Medicine, Nova Southeastern University

Background. The present study investigated a possible chemoattractant role of macrophage migration inhibitory factor (MIF), another ligand for C-X-C chemokine receptor type 4 (CXCR4), in the recruitment of circulating OCPs to the bone lytic lesion. **Methods.** To accomplish this, we used Csf1r-eGFP-knock-in (KI) mice to establish an animal model of polymethylmethacrylate (PMMA) particle-induced calvarial osteolysis. In the circulating Csf1r-eGFP+ cells of healthy Csf1r-eGFP-KI mice, Csf1r+/CD11b+ cells showed a greater degree of RANKL-induced osteoclastogenesis compared to a subset of Csf1r+/RANK+ cells in vitro. Therefore, Csf1r-eGFP+/CD11b+ cells were targeted as functionally relevant OCPs in the present study. **Results.** Although expression of the two cognate receptors for MIF, CXCR2 and CXCR4, was elevated on Csf1r+/CD11b+ cells, transmigration of OCPs toward recombinant MIF in vitro was facilitated by ligation with CXCR4, but not CXCR2. Meanwhile, the level of PMMA-induced bone resorption in calvaria was markedly greater in wild-type (WT) mice compared to that detected in MIF-knockout (KO) mice. Interestingly, in contrast to the elevated MIF, diminished SDF-1 was detected in a particle-induced bone lytic lesion of WT mice in conjunction with an increased number of infiltrating CXCR4+ OCPs. However, such diminished SDF-1 was not found in the PMMA-injected calvaria of MIF-KO mice. Furthermore, stimulation of osteoblasts with MIF in vitro suppressed their production of SDF-1, suggesting that MIF can downmodulate SDF-1 production in bone tissue. Systemically administered anti-MIF neutralizing monoclonal antibody (mAb) inhibited the homing of CXCR4+ OCPs, as well as bone resorption, in the PMMA-injected calvaria, while increasing locally produced SDF-1. **Conclusion.** Collectively, these data suggest that locally produced MIF in the inflammatory bone lytic site is engaged in the chemoattraction of circulating CXCR4+ OCPs. **Acknowledgements. Grants.** This work was supported by NIH grants R03 AG053615 and T32 DE007327.

Resnick Auditorium

2:15 – 2:45 p.m.

Parents of Non-Special Needs Children and Their Attitude Towards Silver Diamine Fluoride as an Alternative Treatment Approach for Carious Lesions

Mitchell Miller, DDS, College of Dental Medicine, Nova Southeastern University
Judith R. Chin, DDS, MS, Professor, College of Dental Medicine, Nova Southeastern University
Romer Ocanto, DDS, Professor, College of Dental Medicine, Nova Southeastern University
Maria Levi-Minzi, M.A., College of Arts, Humanities, and Social Sciences, Nova Southeastern University

Objective. The goal of this study is to determine the acceptance of using SDF treatment among a non-special needs group of children attending Nova Southeastern Universities (NSU) dental clinics at Joe DiMaggio Children's Hospital and Kids in Distress in lieu of alternative treatment approaches. **Background.** Silver Diamine Fluoride is an alternative method to treating carious lesions without the use of a needle and drill to potentially delay or avoid more extensive treatment measures such as oral conscious sedation or general anesthesia. Applied to the caries for 1-3 minutes, SDF arrests the carious lesion and creates a hard, protective barrier to prevent additional decay [1] [2]. **Methods.** An 18-question survey was administered to 100 parents of patients being seen at two of NSU's clinic locations to see if they would select SDF treatment for their child. The clinics utilized for this research were Kid's in Distress and Joe DiMaggio Children's Hospital. SDF acceptance was measured by mean scale score on SDF feasibility questionnaire. Scores can range from 0-3, with higher scores indicating higher levels of SDF acceptance. **Results.** In process, will be completed prior to presentation date. **Conclusion.** In process, will be completed prior to presentation date. **Grant.** Grant Number 335612 Research funded by the Health Professions Division grant.

Retaining Oral Health Knowledge and Skills of School Health Nurses

Ana Karina Mascarenhas, BDS, MPH, DrPH, Professor, College of Dental Medicine, Nova Southeastern University

Objective. To evaluate retention of oral health knowledge and skills of the Miami-Dade County school health nurses after a training program. **Methods.** Data was collected using a 20 item self-administered questionnaire developed using previously tested questions on oral health knowledge and skills. The questionnaire was administered pre and post a four-hour oral health education session to nurses. The training was administered to 214 and 194 medical providers in 2014 and 2015 respectively. Data was entered and analyzed using EXCEL. These analyses to evaluate the retention of knowledge and skills is for those nurses that were trained twice, with one-year between the two sessions. There were 71 nurses trained twice and used in the current analyses. **Results.** In 2014, at pre-test, only 58% of the questions were answered correctly, and after training, on post-test, 92%. In 2015, in the pre-test, 77% of the questions were answered correctly, and after training 96%. Only 17% of nurses trained in 2014 fully retained their knowledge. On average, between the two training sessions there was a loss of knowledge and skills of about 15% or 3 questions. **Conclusion.** Oral health knowledge and skills was poor to start with, but improved with training. However in a year, knowledge reduced. Thus suggesting a need for re-training to sustain and retain knowledge and skills, particularly when it involves new knowledge and skills not previously performed. **Grants.** This project was funded by The Children's Trust of Miami.

Steele Auditorium

Steele Auditorium

10:15 – 10:45 a.m.

Targeting NEDDylation for Therapeutic Gain of Acute Lymphoblastic Leukemia

Shuhua Zheng, Ph.D., OMS-I, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University
Julio Barredo, M.D., Sylvester Comprehensive Cancer Center, University of Miami

Objective. This comprehensive study aims to uncover the therapeutic potential of inhibiting the novel NEDDylation Activating Enzyme (NAE) using pevonedistat for the therapeutic gain of ALL treatment. **Background.** Acute lymphoblastic leukemia (ALL) is the leading cause of cancer-related death in children. Previous data from our lab and others showed that ALL cells are sensitive towards endoplasmic reticulum (ER) stress/unfolded protein response (UPR) inducers. In search for novel strategies to target the ER stress/UPR pathways in ALL, we identified the novel NAE inhibitor pevonedistat can efficiently kill ALL cells in vitro and in vivo. Mechanistic studies indicated that hyper-activation of cytotoxic ER stress/UPR was mainly responsible for pevonedistat-induced ALL cell death. We also identified aberrant activation MEK/ERK signaling in pevonedistat-treated ALL cells as a compensatory pro-survival pathway, co-targeting of which will induce synergistic anti-ALL effects. **Methods.** Molecular biology techniques were used in this study. NSG bioluminescent mouse model was developed to evaluate the in vivo efficacy of pevonedistat. **Results.** We found that pevonedistat treatment induced concomitant activation of p-mTOR (Ser2448) pathway and de-phosphorylation/activation of p-eIF2alpha (Ser51) which will dysregulate the protein homeostasis in ALL cells, triggering proteotoxic ER stress. Combinational treatment of pevonedistat with clinical-in-use drugs showed potent synergistic drug-drug interactions. Further study identified Ca²⁺-dependent activation of MEK/ERK signaling activation in pevonedistat-treated ALL cells as a compensatory pro-survival mechanism. This study leads to the initiation of the Phase I clinical trial of pevonedistat for refractory/relapsed pediatric ALL treatment (ClinicalTrials.gov Identifier: NCT03349281).

Steele Auditorium

10:45 – 11:15 a.m.

HIV/AIDS and Populations at Risk in Broward County, Florida

Alexandra C. Lenox, BS, OMS-II, Dr. Kiran C. Patel College of Osteopathic Medicine, Public Health, Nova Southeastern University

Sharmila Aryal, MPH, Dr. Kiran C. Patel College of Osteopathic Medicine, Public Health, Nova Southeastern University

Cyril Blavo, DO, Professor, Dr. Kiran C. Patel College of Osteopathic Medicine

Objective. 1) Identify risk groups within Broward County with highest prevalence of HIV/AIDS; 2) Inform health professionals on local demographics of HIV/AIDS and inform policies and interventions. **Background.** Human Immunodeficiency Virus (HIV) attacks CD4 cells, leading to immune system destruction and can progress into Acquired Immunodeficiency Syndrome (AIDS). There is no effective cure for HIV/AIDS. The CDC reports that 1.1million people in the US have HIV and 1 in 7 people are unaware that they are infected. This study provides an analysis of Broward County populations at-risk for contracting HIV, and provides insight into health disparities and intervention strategies. **Methods.** Secondary data analysis with Microsoft Excel using de-identified data from AIDSvu and CDC National Surveillance Database from 2012-2015. Variables of interest included: age, gender, race, and zipcode. **Results.** In each of the years studied, black males, 45-59 years old, residing in the 33311 zip-code had the highest rates of HIV/AIDS in Broward County. Males consistently had higher rates of HIV/AIDS compared to females. The black population consistently had higher rates of HIV/AIDS over other races – followed by the white and hispanic populations, respectively. The 25-44 age group consistently had the second highest rate of HIV/AIDS. This zip-code observation parallels other disease statistics that indicate greatest prevalence in the 33311 zip-code including pediatric asthma and diabetes. **Conclusion.** There is a demand for HIV/AIDS health initiatives within Broward County, specifically in the 33311 region. Further studies aimed at gaining insight into disease management and access to clinical support for this at-risk population are necessary. **Grants.** None.

Effects of Methionine Gamma Lyase-Deaminase on Human Colorectal Carcinoma Cells

Rebecca S. Nosal, OMS-II, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University
Eduardo Diaz, OMS-I, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University
Randy Leibowitz, OMS-II, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University
Kallidaikurich V. Venkatachalam, Ph.D., Professor, College of Medical Sciences, Nova Southeastern University

Objective. The objective of this study is to demonstrate the effects of methionine gamma lyase-deaminase (Mgld) on colorectal carcinoma cell survival using MTT assay. **Background.** Mgld is an enzyme found in bacteria and protozoa including, *Porphyromonas gingivalis*. Mgld has the ability to catabolize methionine, an enzyme function that is absent in mammals. This enzyme function is of interest in methionine/S-adenosyl methionine (SAM) dependent cancer cells given the dysregulation of DNA methylation patterns that occur compared to normal mammalian cells. **Methods.** In this study, *Porphyromonas gingivalis* Mgld cloned into a cytoplasmic and nuclear plasmid vector was transfected into the human colorectal carcinoma T84 cell line using Lipofectamine 3000. The effects of cytoplasmic Mgld and nuclear Mgld were assessed in comparison to control non-transfected cells. Cell survival was assessed with an MTT assay at 570 nm as an indicator of metabolic functions of the live cells/mitochondria. **Results.** Results indicate that nuclear Mgld transfection causes most significant inhibition of metabolic activity in T84 colorectal carcinoma cells with a 19% decrease in absorbance compared to the control. **Conclusion.** Due to its effects on cellular survival, further studies should be conducted to evaluate and investigate the metabolic implications of nuclear Mgld on T84 colorectal carcinoma cells.

Awakenings: An Equine Assisted Learning Research Project

Shelley Green, Ph.D., Professor, College of Arts, Humanities, and Social Sciences, Nova Southeastern University
Monica Schroeder, M.S., College of Arts, Humanities, and Social Sciences, Nova Southeastern University
Michael Rolleston, M.S., College of Arts, Humanities, and Social Sciences, Nova Southeastern University
Cynthia Penalva, M.S., College of Arts, Humanities, and Social Sciences, Nova Southeastern University

Objective. The purpose of this pilot study was to determine if and how the Awakenings Equine Assisted Learning program was effective at improving the professionalism, confidence, communication skills and adaptability of students preparing for careers as Anesthesiologist Assistants. **Background.** Equine Assisted Learning (EAL) is a rapidly growing experiential model that utilizes horses to enhance participants' awareness of their own non-verbal language, communication styles, projection of self-confidence and competence, and problem-solving abilities (Chandler, 2012; Green, 2012, 2013; Kane, 2012; Trotter, 2012). **Methods.** As a part of their regular educational and clinical rotations, first year students in the Anesthesiologist Assistant (AA) program participated in a 6- week training that included weekly, 2 -hour Equine Assisted Learning (EAL) sessions. Each session, the AA students participated in a 2- hour experiential equine assisted activity, specifically designed to address a certain target area necessary for their development as professionals in this field. The participants completed a pre and post assessment with 93 items that measured development as they relate to the EAL sessions. **Results.** The data was analyzed using t-tests, exploratory factor analysis, and qualitative self-reports. Confidence, empathy, awareness, and communication were the most significant factors. **Conclusion.** The qualitative data reinforced the quantitative findings that showed significant improvement in the objective factors as a result of the EAL sessions.

A Unique Case of Lemierre Syndrome Caused by Streptococcus Constellatus Introduced by a Pharyngeal Injury

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Andrew D. Beckler, M.D., Center for Advanced Facial Plastic, Reconstructive and Cosmetic Surgery,
Otolaryngology Consultants, PA

Mark Meyer, M.D., Thoracic Surgery, 21st Century Oncology, LLC
Michelle Demory Beckler, Ph.D., College of Medical Sciences

Introduction. Lemierre Syndrome is a rare, potentially life-threatening infection that typically develops from invasion of bacteria through pharyngeal mucosal tissue, followed by septic thrombophlebitis, most often involving the internal jugular vein. Nearly 90 percent of cases are caused by *Fusobacterium necrophorum*. The current case describes *Streptococcus constellatus*, a component of the natural flora, as the causative agent of Lemierre syndrome. **Case Presentation.** A 40-year-old female presented with odynophagia, neck swelling, erythema and induration, as well as dysphonia and mild tenderness to palpation. Laryngoscopy showed serofibrinous debris and thickened secretions. CT scan of the neck showed a large fluid and gas collection originating from the left hypopharynx and extending into the left parapharyngeal region. The CT scan also showed focal narrowing of the left internal jugular vein with a flow void indicative of thrombus. Dissection in the deep tissues of the neck revealed purulent drainage that was sent for culture. The wound culture grew *Streptococcus constellatus* and the patient responded well to IV antibiotics. **Deviation from the Expected.** The present case describes an atypical causative agent for Lemierre syndrome: *Streptococcus constellatus*. **Discussion.** The pathogenesis of Lemierre Syndrome is complex and not well defined. What is known is that *Fusobacteria necrophorum* is the most common cause of Lemierre syndrome. Complications of this disease can be caused by dissemination of septic emboli which travel to major organs and cause damage. Accordingly, prompt diagnosis and treatment of Lemierre syndrome is critical to ensure improved patient outcomes. **Conclusion.** Despite only one other reported case of *Streptococcus constellatus* as the cause of Lemierre syndrome, it is important to identify this organism as a possible cause due to the severity of the disease without proper treatment.

Terry, Jonas, and Finkelstein Auditoriums

Terry, Jonas, and Finkelstein Auditoriums

10:45 – 11:15 a.m.

Autophagy-Mediated Immunoregulatory Properties of MIAMI Cells

Vladimir Beljanski, Ph.D., Assistant Professor, College of Allopathic Medicine, Nova Southeastern University
Fiorella Rossi, Center for Collaborative Research, Nova Southeastern University

Mesenchymal stromal cells (MSCs) are frequently used in tissue regeneration as they can be easily isolated and expanded; they maintain progenitor properties, possess a capacity to differentiate into specific cell types, and secrete soluble factors that facilitate regeneration of damaged tissues by multiple mechanisms, including immunomodulation. Immunomodulatory properties of MSCs are associated with their ability to 1) secrete soluble factors upon sensing an inflammatory environment and 2) engage in cell-cell contact with immune cells. Autophagy is a lysosomal-dependent catabolic stress-response mechanism that is upregulated in response to a variety of “stressors” such as starvation, growth factor deprivation, endoplasmic reticulum stress, and/or pathogen infection. Autophagy regulates antigen presentation, cytokine secretion and also secretion of soluble factors. Therefore, we hypothesize that autophagy may be involved in regulating MSCs’ immunomodulatory properties. To test this hypothesis, we utilized a subtype of MSCs called “marrow-isolated adult multilineage inducible” (MIAMI) cells due to their ease of isolation from bone marrow, high differentiation capacity, as well as their immunomodulatory and tissue repair capacities. To enhance MIAMI cells immune-regulatory properties, we pre-treated them with IFN-gamma and, at the same time, treated them with autophagy stimulator or inhibitor drugs. MIAMI cells were exposed to 500U/ml IFN-gamma alone or together with 5 μ M Tamoxifen (an autophagy stimulator), or 10 μ M of Chloroquine (an autophagy inhibitor) for 4 days. The cells were subjected to RNA sequencing (RNA-seq) to determine the effects of autophagy modulation on global gene expression. In addition to RNA-seq, we are also evaluating changes in expression of regulatory microRNAs in these cells. Furthermore, preliminary results using co-culture assays suggest that MIAMI cells increase CD4+ T cells regulatory phenotype indicated by the increase in T cell regulatory markers (CD4+CD25+CD127+). Altogether, this project will contribute to development of novel therapeutic approaches where modulation of autophagy may be used to modify therapeutic properties of MIAMI cells.

Videoconferencing: Broadcast from Jonas Auditorium to regional campuses, and Terry and Finkelstein Auditoriums.

Terry, Jonas, and Finkelstein Auditoriums

11:15 – 11:45 a.m.

Dendritic Cell Gene Expression and CD4 T Cell Viral Reservoirs in HIV Infections

Travis Craddock, Ph.D., Associate Director/Assistant Professor, College of Allopathic Medicine, Nova Southeastern University

Gordon Broderick, Ph.D., Center for Clinical Systems Biology, Rochester General Hospital

Mario Stevenson, Ph.D., Leonard M. Miller School of Medicine, University of Miami

Shannon Murray, Ph.D., College of Allopathic Medicine, Cell Therapy Institute, Nova Southeastern University

Objective. To determine whether gene expression in myeloid dendritic cells (mDC) is correlated to the size of the human immunodeficiency virus (HIV) reservoir in CD4 T cells during antiretroviral therapy (ART)-treated HIV infections. **Background.** mDC are innate immune cells that respond to viral infections. One barrier to curing HIV infections is the existence of latent reservoirs after HIV integrates into the genome of CD4 T cells. There is a critical need to examine the role of mDC in viral reservoir maintenance to inform strategies to counteract HIV latency.

Methods. We will quantify the HIV reservoir in CD4 T cells and assess the gene expression of mDCs from successfully ART-treated (ST) individuals. Using these data, we will develop a computational approach to model the relationship between mDC gene expression and the size of HIV reservoirs in CD4 T cells. **Results.** We identified genes and pathways in mDC that correlated with HIV reservoir levels in CD4 T cells, which differed depending on treatment status. We anticipate that a larger cohort of ST subjects will enable the further identification of genes and pathways of mDC that correlate with HIV reservoir levels. **Conclusion.** These results will inform targets for the control or elimination of latent reservoirs in HIV curative approaches. This work has the potential to identify new biomarkers for determining reservoir size and inform strategies such as DC vaccination regimes for eradicating viral

reservoirs during HIV infections. **Grants.** The Institute of AIDS and Emerging Infectious Diseases (IAEID) Pilot Grant, Florida Department of Health, awarded to Shannon Murray. **Videoconferencing:** Broadcast from Jonas Auditorium to regional campuses and Finkelstein Auditorium.

Terry, Jonas, and Finkelstein Auditoriums

11:15 – 11:45 a.m.

Dead Things Don't Swell

Karin R. Lypka, OD, College of Optometry, Nova Southeastern University

Introduction. Elevated blood pressure can lead to malignant hypertension and is a significant risk factor for the development of retinal artery occlusions. New management guidelines indicate that patients with transient ischemic attacks, including transient monocular vision loss, and retinal artery occlusions should be urgently referred to a specialized stroke unit for proper assessment. **Case presentation.** A 50-year-old Haitian male patient with symptomatic dimming vision presented with malignant hypertension along with a branch retinal artery occlusion in the right and a suspected previous central retinal artery occlusion in the left eye, evidenced by a history of sudden, painless vision loss, an atrophic retina, attenuated sclerotic arterioles and optic nerve head pallor. **Deviation From the Expected.** Hypertension is a systemic condition. Here, we discuss a unilateral presentation of malignant hypertension secondary to a previous retinal artery occlusion leading to inner retinal cell death and necrosis. **Discussion.** Transient vision loss can occur secondary to retinal artery occlusions and is an established prodromal indicator of ischemic stroke. 10-15% of patients experiencing a TIA have a stroke inside 90 days, half of those transpire within 48 hrs. 24% of patients have shown acute ischemic strokes on MRI, while neurologic signs and symptoms were not present in 38% of those individuals. **Conclusion.** Patients with transient ischemic attacks and retinal artery occlusions need to be further investigated for a stroke with referral to a specialized stroke unit and a diffusion-weighted MRI. **Grants.** None. **Videoconferencing:** Presented live from Terry Auditorium.

Terry, Jonas, and Finkelstein Auditoriums

11:45 a.m. – 12:15 p.m.

The Test-Retest Reliability and Minimum Detectable Change of a Dynamometric Device Used to Quantify Lifting Strength

Morey J. Kolber, Ph.D., Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Peter A. Sprague, DPT, Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Emily Passint, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Dominic Mascia, Nova Southeastern University

Michael Marquis, Nova Southeastern University

Objective. Determine the test-retest reliability and minimum detectable change (MDC) of a dynamometric device (DYN) used to quantify isometric lifting strength. **Background.** The ability to perform lifting maneuvers from varying heights is a basic activity of daily living. Lifting assessments are used to quantify strength, profile injury risk, and determine work capacity. Vertical lifting strength from below the waist may be quantified using free-weights, lift-boxes, and dynamometry. While DYNs are most efficient for testing time and portability (eliminate need to use weights), a paucity of research exists to determine their reproducibility and error-based clinimetric properties. **Methods.** Fifty healthy participants (mean age 25-years) were recruited via convenience sampling. Following consent, participants underwent a brief warm-up followed by the lifting assessment. Participants stood on a platform; knees and hips slightly flexed, maintained a lumbar spine lordosis and grasped the DYN handle at knee level. Upon command, participants lifted in a vertical direction with maximum effort. Four repetitions were completed 1-minute apart and repeated 48-hours later. **Results.** Intersession test-retest reliability was excellent, with an intraclass correlation coefficient $(3,1) = .969$. The MDC (90% confidence interval) was 18 kilograms (kg). **Conclusion.** The DYN used in this study possessed excellent reliability during the initial phase of lifting where physical demands are the greatest. The MDC_{90} indicates that changes of 18kg or greater are needed to exceed the threshold of error. A limitation of this study is the use of an isometric task, which is only one position of a dynamic functional lifting task. **Videoconferencing:** Broadcast from Jonas Auditorium to regional campuses and Terry and Finkelstein Auditoriums.

Recommendations for Care of Geriatric Maxillofacial Trauma Patients Following a Retrospective Ten Year Multicenter Review

Robert Batdorf, BS, D3, College of Dental Medicine, Nova Southeastern University

Objective. The purpose of this study was to analyze maxillofacial trauma sustained by patients at least 75 years old. With the injury patterns identified, treatment recommendations for the contemporary oral and maxillofacial surgeon are made. **Patients and Methods.** This study was a retrospective case series using data from 2 level 1 trauma centers. The variables of interest included age at traumatic event, gender, mechanism of trauma, concomitant injuries, radiographic studies performed, management of maxillofacial injuries, and disposition. Numerical analysis was completed with statistical software. **Results.** One hundred seventy-six patients at least 75 years old who sustained facial trauma were identified. Ground-level falls caused most cases of maxillofacial trauma in the geriatric population. The median age at the time of trauma was 83 and 85 years for men and women, respectively. The most common injuries were midface fractures. Intracranial hemorrhage was the most common concomitant injury, and all but 1 patient underwent computed tomography of at least the head after their traumatic event. Most maxillofacial injuries were treated without operative repair. **Conclusions.** The information gained from this study suggests that oral and maxillofacial surgeons should counsel geriatric patients on the risk of falls and encourage the prevention of potential hazards for falls in their homes. **Videoconferencing:** Presented live from Terry Auditorium.

Time-Compressed Speech in the Auditory Processing Evaluation

Katharine Fitzharris, Ph.D., AuD, Assistant Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Jackie M. Davie, PhD, Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Objective. Examine the internal validity of the time-compressed PBK and NU-6 word lists in a pediatric population seen for clinical auditory processing evaluations (APEs). **Background.** Temporal alterations to speech stimuli are used to assess a listener's ability to process information when acoustical redundancy is minimized (i.e., monaural low redundancy). Two time-compressed tests used with adolescents include the PBK and NU-6. Anomalous patterns of results were observed during data analysis within a larger chart review research project, which provoked a closer evaluation of the time-compressed PBK and NU-6 test results. **Methods.** Retrospective chart review of over 100 APEs completed in the NSU Audiology clinic from July 2012 to July 2017. Data extracted from electronic medical records included results from the test battery, diagnosis, and individual subject responses from scans of the original score sheets. **Results.** In total, 242 individual half-lists were run (PBK= 114). Data analysis revealed that the lists were not equivalent within the individual compression ratios; average List 1 scores were significantly higher than average List 3 scores for both the PBK and NU-6, independent of compression ratio. Further, the NU-6 word lists were determined to have significant ceiling effects. The average scores were different from the results published when the lists were developed: average NU-6 scores are considerably higher than average scores originally published by Beasley and colleagues (1972). **Conclusion.** Significant technical issues were found in both the compressed versions of the PBK and NU-6 lists suggest these measures may not be appropriate for use in clinical APEs. **Videoconferencing:** Broadcast from Jonas Auditorium to regional campuses and Finkelstein Auditorium.

Hip and Pelvis Biomechanics During Running as Predictors of Injury in Collegiate Runners: A Prospective StudyMonique Mokha, Ph.D., Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University
Dustin Gatens, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Objective. The objective of the study was to determine if hip and pelvis biomechanics during running could predict musculoskeletal injury (MSI) in collegiate runners. **Background.** Faulty running biomechanics have been linked to

an increased musculoskeletal injury risk in adult, female distance runners. Collegiate runners may benefit from the identification of pathomechanics prior to the start of a season. **Methods.** Eight female and four male (age, 19.8±2.1 yrs; height, 1.66±0.08m; mass, 57.8±7.0kg; 40.2±15.1 miles/wk) healthy, NCAA Division II cross country runners participated in this prospective cohort study. Runners underwent 3D motion analysis of their kinematics [peak hip adduction (HADD), hip internal rotation (HIR), contralateral pelvis drop (CPD)] on an instrumented treadmill prior to the season's start. Injuries were tracked for an academic year by the teams' certified athletic trainer via an electronic medical record. Pearson Chi-square analyses were used to determine if MSI could be predicted by HADD, HIR, and CPD, $p < .05$. **Results.** Nine runners (75.0%) sustained a total of 27 lower extremity MSI. Runners with excessive HADD were more likely to sustain a MSI ($\chi^2=14.496$, $p=.036$). Injured runners displaced greater HADD peak motion than non-injured, 12.2±4.7 vs 7.4±4.7°, respectively. HIR and CPD were not significant predictors of MSI in this group, $p > .05$. **Conclusion.** Runners may be at risk for lower extremity MSI if they have increased HADD during running. Collegiate runners may benefit from motion analysis prior to the start of the season as part of an injury prevention strategy to identify pathomechanics. **Grants.** This study did not receive funding. **Videoconferencing:** Presented live from Terry Auditorium.

Terry, Jonas, and Finkelstein Auditoriums

2:45 – 3:15 p.m.

Laparoscopic Inguinal Hernia Repair with Mesh: A Case Review

John W. Rafalko, Ed.D., Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Kaylin Dighton, PAS-2, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Chay Malvasio, PAS-2, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Aaron Storm, PA-S2, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Heather Bryant, PA-S2, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Heather Nunnally, PA-S2, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Rachel Frankenthal, PAS-2, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Introduction. Hernias occur when intra-abdominal contents protrude through a fascial defect in the abdominal wall. Inguinal hernias make up the majority of abdominal hernias in both men and women. The definitive treatment for all hernias is surgery. **Case presentation.** An adult male presented with heaviness and discomfort in his right groin region that began six months ago. Discomfort was worse at night. Patient's job required standing up for most of the day. No obvious bulge was seen during physical exam, though a bulge was palpable in the inguinal canal during the testicular exam. Patient was overweight with a history of an appendectomy. **Deviation from Expected.** An elective laparoscopic TAPP (transabdominal preperitoneal approach) was used for repair. After repairing the right indirect, inguinal hernia, the surgeon discovered a second indirect, inguinal hernia on the left side and repaired that hernia as well. There were no complications. **Discussion.** Open and laparoscopic repairs are the most popular surgical interventions for indirect, inguinal hernias. Both approaches are acceptable and carry their own advantages and disadvantages. The technique utilized will depend on the patient's clinical presentation and the surgeon's preference. **Conclusion.** Surgical repair of inguinal hernias is, and will continue to be, one of the most common operations worldwide. Ever-evolving advancements in diagnostic imaging, laboratory modalities and surgical techniques have allowed clinicians to rapidly assess and rule out any emergent complications and treat indirect inguinal hernias with a heightened level of care. **Grants.** This study was not funded by a grant. **Videoconferencing:** Presented live from Terry Auditorium.

Terry, Jonas, and Finkelstein Auditoriums

2:45 – 3:15 p.m.

Effectiveness of an Ergonomic Program for Dental Students

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Kathryn Stenftenagel, OTS, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University
Emili Walker, OTS, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Objective. The purpose of this study was to develop an ergonomic program for dental students using the participatory ergonomic approach and to explore the effectiveness of such program. The researchers sought to determine if a participatory ergonomic program would decrease work related musculoskeletal disorder (WRMSD) symptoms among dental students. **Background.** The tasks performed during the delivery of dental services align with several risk factors associated with WRMSDs. Literature suggests that dental professionals develop WRMSDs while they are in dental school however, no ergonomic program has been developed to address this problem. **Methods.** A quantitative pretest/posttest design was utilized and analyzed using paired t-tests and the Wilcoxon Signed Rank Test. **Results.** Participants identified ergonomic risk factors and contributed to the development of ergonomic solutions. The ergonomic strategies were implemented for three months. Changes in scores from pre-test to post-test reached statistical significance in two outcome measures including shoulder pain and the Neck Disability Index. **Conclusion.** Participants identified and utilized strategies such as altering their grasp on tools, improving indirect vision proficiency, musculoskeletal stretches, intentional scheduling and rest periods. Although statistical significance was reached on two outcome measures, the sample size was not large enough or diverse enough to generalize the results to all dental students. Further analysis of the data is needed to determine if activities, outside those performed in dental school, could have contributed to the development of musculoskeletal disorders. Lastly, it could be questioned whether a three month intervention period is long enough to significantly influence a musculoskeletal disorder. **Videoconferencing:** Broadcast from Jonas Auditorium to regional campuses and Finkelstein Auditorium.

POSTER PRESENTATIONS

Atrium

Atrium – Poster 1

12:15-1:15 p.m.

Opioid Complexation and Abuse Performance of Crosslinked Cellulose and Starch Derivatives

Rand H. Ahmad, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University
Christina M. Crum, BS, P4, College of Pharmacy, Nova Southeastern University
Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The objective was to determine the percentage of Dextromethorphan HBr (DEX) that, in the form of complex, could be loaded into two crosslinked anionic polymers, carboxymethyl starch (CMS) and carboxymethyl cellulose (CMC) at low and high ratios, and to determine the extent to which the complexation ratio influences the abuse deterrence capacity. **Background.** We previously disclosed polymer-drug complexes that can effectively minimize the amounts of extracted drug under abuse conditions. We have also shown that CMS and CMC have great potential to form effective polymer-drug complexes. **Methods.** CMS/CMC were mixed with DEX in water at 8:1 and 1.3:1 weight ratios. Followed by washing, the complexes were dried and milled. Drug loading was determined in 0.1N HCl. Accordingly, given amounts of the complexes (equivalent to 25 mg DEX) were dispersed in 10mL aqueous solutions. The % drug in solution was determined by UV Spectrophotometer. IR spectroscopy was used to characterize drug loading capacity. **Results.** At low and high drug/polymer ratios, the amounts of drug loaded onto 1g of polymers were respectively found 99mg and 117mg (for CMS) and 112mg and 602mg (for CMC). IR spectra coefficients were 0.98 and 0.85 for CMS and CMC complexes, respectively. Deterrence performance within the CMS group were comparable ($\leq 6\%$ differences), but CMC complexes showed up to 35% difference in their deterrence performance. **Conclusion.** Higher functionality of CMC offered higher loading capacity. The high-loaded complexes were found more sensitive to ions present in the solution. **Grants.** This study was supported by NSU Grant 335081

Atrium – Poster 2

12:15-1:15 p.m.

Probe Penetration Method to Characterize Low Solid High Viscous Pharmaceutical Gel Compositions

Rand H. Ahmad, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University
Samaneh Alaei, College of Pharmacy, Nova Southeastern University
Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The objective was to develop a discriminatory analytical technique to evaluate rheological properties of low solid high viscous gel compositions used in the preparation of semi-solid pharmaceutical dosage forms. **Background.** Rheological properties of materials are frequently described in terms of viscosity, which is defined as resistance to flow. Compositions displaying strong gel consistency do not flow unless the applied stress exceeds certain value “Yield Stress”. In this study, we propose a Probe Penetration Method for better characterization of gels displaying yield stress when used at very low concentrations. **Methods.** Different types of carbomer solutions (carbomer homopolymer, copolymer, interpolymers, and polycarbophil) were prepared in water at different concentrations (0.1-1.0% w/w). Using sodium hydroxide, the pH of solutions was adjusted to 5.0-6.0, and the gel strength was measured using CT3-Texture Analyzer for non-neutralized and neutralized samples. The test records sample resistance to a penetrating stainless-steel probe (@ speed of 0.5mm/s). The test starts when the designated trigger load (10mN) is reached (at sample surface), then travelling 25mm distance representing sample center. **Results.** The control solutions, regardless of their concentrations, showed minimal differences in their gel strength values, 12-31mN. The results after neutralization demonstrated higher values and varied among different concentrations; carbomer homopolymer 18-196mN, copolymer 28-132mN, interpolymers 21-238mN, & polycarbophil 20-118mN. **Conclusion.** Given its discriminatory capability, the gel strength measurement by probe penetration method can be used in studying the rheological properties of highly viscous gel materials used at less than 1% concentrations. **Grants.** This study was supported by NSU Grant 335081

Effect of Crosslink Density and Concentration on Rheological Properties of Crosslinked Acrylic Acid Homopolymers

Rand H. Ahmad, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Samaneh Alaei, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. In this study, using gel strength analysis we measured the effect of polymer crosslink density and its concentration on rheological behavior of poly(acrylic acid) gelling agents in aqueous solutions. **Background.** Crosslinked acrylic acid homopolymers are commercially available in different types and grades suitable for wide range of pharmaceutical applications, in particular in semi-solid dosage forms. At pH 5-8, these polymers thicken, forming viscous gels in aqueous or hydroalcoholic solutions. Although the effect of structural and environmental factors have widely been reported in terms of solution viscosity, the gel strength analysis was found to be very informative in characterizing flow behavior of such formulations. **Methods.** Different polymer (lightly and highly crosslinked) solutions were prepared in water at 0.1%, 0.3%, 0.5%, 0.7%, and 1.0% w/w concentrations. The pH of the solutions was adjusted to 5-6, and the gel strength was measured using a Texture Analyzer before and after neutralization. **Results.** The gel strength of the neutralized lightly and highly crosslinked polymer solutions at 0.1-1.0% w/w concentrations ranged from 28-56 mN, and 18-196 mN, respectively. **Conclusion.** Degree of crosslinking affected the rigidity and uncoiling behavior of the polymer in solutions. Lightly crosslinked structures are less rigid and become easily uncoiled in solutions, resulting in greater interaction with the solvent and thus higher gel strength at low concentrations. On the other hand, highly crosslinked structures, despite their lower uncoiling and solvent interaction, provide higher gel strengths when used at higher polymer concentrations. **Grants.** This study was supported by NSU Grant 335081.

Herschel-Bulkley Model Describing the Rheology of Polyacrylates Superabsorbent Homopolymers

Samaneh Alaei, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Rand Ahmad, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The objective was to investigate the fitness of Newtonian and non-Newtonian rheological models in characterizing the rheological behavior of two grades of polyacrylic acid homopolymers commonly used in the preparation of semi-solid pharmaceutical dosage forms. **Background.** Bingham model is relevant to Newtonian flow. Herschel-Bulkley and Casson are relevant to non-Newtonian behavior, with the latter being pertinent to suspension systems. All the three models are used to describe materials with yield stress. In this study, we examined the rheological behavior of two polyacrylate homopolymers differing in their degrees of crosslinking. **Methods.** The samples were prepared in water at 0.1-1.0% w/w concentration range and neutralized by NaOH (pH 5.0-6.0). Cone and plate rheometer (spindle 2.4cm, 0.5mL sample) was used to generate the shear stress/shear rate and viscosity/shear rate rheograms. The confidence of fit (COF) to the three models was determined using Rheolac V3.3 software. **Results.** Herschel-Bulkley model fitted all concentrations of carbomer samples with COF exceeding 99%. Confidence of fit for Bingham and Casson models did not exceed 88% and 97%, respectively. Viscosity/shear rate profiles demonstrated shear thinning behavior and shear stress/shear rate profiles showed yield stress values ranging from 36-1703 D/cm² and 188-947 D/cm² for the highly crosslinked and lightly-crosslinked carbomers, respectively. **Conclusion.** Hydrophilic non-Newtonian polyacrylate homopolymers, possessing yield stress are best described by Herschel-Bulkley model, where the material is in solution, exhibiting shear thinning flow after the yield value is surpassed. **Grants.** This study was supported by NSU Grant 335081.

Rheological Behavior and Modelling of Hydrophobically-Modified Gelling Agents Used in Pharmaceutical Semi-Solids

Samaneh Alaei, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Rand Ahmad, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The objective was to study the effect of concentration on the rheological behavior of hydrophobically-modified polyacrylic acid polymers and fitness to two rheological models for non-linear flow. **Background.** Carbomer copolymer type B and carbomer interpolymer type A are polyacrylic acid polymers, modified with a long alkyl chain. Our previous studies showed non-linear rheological behavior for these polymers. There are two models commonly used to describe materials with yield stress and non-linear flow; the Herschel-Bulkley and Casson models, with the Casson being pertinent to systems tending to form aggregates. **Methods.** Samples were prepared in water at different concentrations ranging from 0.1-1.0% w/w. Following neutralization with NaOH (pH 5.0-6.0), the rheological behavior of the samples was examined using a cone and plate rheometer, and the two models were evaluated for their confidence of fit (COF) to the experimental results. **Results.** Herschel-Bulkley model fitted all the samples with COF >99.5%, except for 1.0% w/w concentration, which was best fit with Casson model (COF of 100% and 96% for the copolymer and interpolymer, respectively). Shear thinning behavior was presented in the viscosity/shear rate plots, and yield stress values ranged from 85-1538(D/cm²) for copolymer and 46-1967(D/cm²) for the interpolymer. **Conclusion.** The rheological behavior of hydrophobically-modified carbomers is affected by their solution concentration. At low concentrations, the materials are soluble, thus best fitting Herschel-Bulkley model. At high concentrations and due to lower solubility of the hydrophobic moieties, particles tend to aggregate and fit the Casson model. **Grants.** This study was supported by NSU Grant 335081.

Development and Validation of Florida Pharmacists' Knowledge Scale of Medicare Part D Pharmacist-Based Medication Therapy Management

Hayam A. AlRasheed, PharmD, Ph.D. student, College of Pharmacy, Nova Southeastern University

Barry Bleidt, PharmD, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The aim of this study was to expand the theory of planned behavior model by adding knowledge construct to assess whether pharmacists' overall knowledge level about MTM impacts the pharmacists' perception to provide such services. **Background.** MTM model is required by the Medicare Modernization Act 2003 as one of the services that take care of the patients. Under the Affordable Care Act (ACA) of 2010, there were significant changes in MTM programs through expanded requirements and improvement measures to further support MTM programs. Little is known about pharmacists' knowledge of MTM after the changes that resulted from the ACA of 2010. **Method.** Knowledge scale was created after an intensive literature review. The scale was generated based on face and content validity and the reliability and internal consistency. The internal consistency was improved to purify the scale. The scale was reduced from 33 to 24 items; include background and process sub-dimensions. The "mock" survey was applied to third-year Pharm.D students at NSU using survey monkey. **Result.** Cronbach's Alpha coefficients were 0.962 for the entire scale, 0.923 for the background subscale, and 0.947 for the process subscale. The scale was assessed to understand the factors loadings of the knowledge scale. The results indicated 5-factor solution. **Conclusion.** This study is the first to identify construct of interest in assessing pharmacists' knowledge regarding MTM services and offered evidence of the reliability of the scale. It is anticipated that the scale will be utilized to assess the change in knowledge level as MTM services expanded as results of ACA.

Are High-Protein Diets Really Bad to the Bone?

Jose Antonio, Ph.D., Assistant Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Cassandra Carson, D.O., Director/Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Anya Ellerbroek, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Corey Peacock, PhD, Assistant Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Tobin Silver, PhD, Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Objective. The purpose of this investigation was to determine if a high-protein diet affected various parameters of whole body and lumbar bone health in exercise-trained women. **Background.** It has been posited that consuming a high-protein diet causes calcium to leach from your skeleton; thus promoting demineralization. **Methods.** Twenty-four women volunteered for this investigation (n=12 control, n=12 high-protein). The control group was instructed to consume their habitual diet; however, the high-protein group was instructed to consume >2.2 grams of protein per kilogram body weight daily (g/kg/d). Body composition was assessed via dual-energy x-ray absorptiometry (DXA). Subjects were instructed to keep a food diary via the mobile app MyFitnessPal®. **Results.** During the 6-month treatment period, there was a significant difference in protein intake between the control and high-protein groups (control: 1.5±0.3, high-protein: 2.8±1.1 g/kg/d); however, there were no differences in the consumption total calories, carbohydrate or fat. Furthermore, there were no changes in any measure of body composition (i.e., lean body mass, fat mass, bone mineral content, bone mineral density, and body fat %). **Conclusion.** Despite an 87% higher protein intake (high-protein versus control), 6 months of a high-protein diet had no effect on any measures of bone health or body composition.

Postpartum Depression

Samantha Appel, Entry Level Nursing Student, College of Nursing, Nova Southeastern University

Jessica Blackman, College of Nursing, Nova Southeastern University

Erika Collazos, College of Nursing, Nova Southeastern University

Ana Espinal, College of Nursing, Nova Southeastern University

Jeffery Summerlin, College of Nursing, Nova Southeastern University

Meagan Williams, College of Nursing, Nova Southeastern University

Pregnancy is usually a joyous occasion but all too often, postpartum depression has led to negative outcomes for all involved and must be seen as a grave mental disorder (Camp, 2013). It is important to be able to differentiate between baby blues and postpartum depression. Baby blues occur within the first couple of days to weeks of the child being born (Ohara & McCabe, 2013). Postpartum depression has the capability of being a debilitating disorder that not only affects the mother but also the father and the child. With little known as to what causes postpartum depression, there are tools and screenings that are available that may help to identify someone at risk. With postpartum depression affecting 10-20% of mothers roughly, it is important to understand how to manage and treat it (Lind, Richter, Craft, & Shapiro, 2017). The Edinburgh Postnatal Depression Scale (EPDS) has been implemented and used in practice to help health care providers address the issue. This standardized screening uses a scoring system that is able to quantify if the mother requires further targeted care (Lind, Richter, Craft, & Shapiro, 2017). Nursing is often a multifaceted profession that helps to meet the needs of many different types of patients. Often people don't identify mental illness as a serious disorder but with appropriate education and teaching, nurses will be able to better provide these patients with the most adequate care. It is always important to assess the patient and surrounding issues, provide necessary assistance, give appropriate and necessary recommendations, and offer encouragement as needed.

Participation in a Co-Curricular Program Designed to Address CAPE Outcomes Domain 4

Graciela M. Armayor, PharmD, Assistant Professor, College of Pharmacy, Nova Southeastern University
Rochelle Nappi, Ed.D., Assistant Dean of Operations, College of Pharmacy, Nova Southeastern University
Robb McGory, PharmD, Associate Dean, College of Pharmacy, Nova Southeastern University

Objective. To evaluate student participation in a co-curricular program designed to address CAPE Outcomes-2013. **Background.** Pharmacy accreditation standards include CAPE Outcomes that describe student maturation in specified areas as well as a co-curricular program to expose students to various areas of practice. **Method.** A Professional Development Checklist (PDC) was created using CAPE Outcomes subdomains of self-awareness, leadership, innovation/entrepreneurship, professionalism in addition to university stewardship to structure learning experiences. Specific activities were assigned to each category to provide students a guide for selecting experiences. P1 students were required to complete 6 co-curricular experiences; two in Professionalism, one in University Stewardship and three from any category. Participation in co-curricular activities was assessed using data collected from the PDC documentation form submitted at the end of 2016 fall semester. Participation rate was determined by counting the number of completed experiences within categories. **Results.** 191 students submitted completed forms. Collectively students completed 1147 co-curricular experiences, a mean of 6 experiences/student in 4 of 5 PDC categories. 112 students (59%) completed 6 activities, 36 (19%) completed more and 43 (22%) completed less. 43% of all experiences were in the Professionalism category followed by Self-awareness (20%), University Stewardship (19%), Leadership (15%), and Innovation/entrepreneurship (3%) categories. Attending a college sponsored event (99%), leadership training (85%), or self-improvement seminar/event (64%) were the most frequently chosen elective experiences. **Conclusion.** Students appear to select easily achievable co-curricular activities. Encouraging new activities is enhanced by a PDC, but more stringent limitations are necessary to attract students to unfamiliar experiences. **Grants.** None

The Effects of Peanut Butter Overfeeding on Body Composition

Cara Axelrod, Nutrition, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University
Cassandra Carson, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University
Anya Ellerbroek, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University
Corey Peacock, PhD, Assistant Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University
Tobin Silver, PhD, Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University
Jose Antonio, PhD, Assistant Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Objective. The purpose of this investigation was to assess the effects of short-term peanut butter overfeeding on body composition in active men and women. **Background.** There is no prior research on what happens to body composition when overfeeding on a particular food. **Methods.** In a single-arm open-label trial, six exercise-trained subjects (2 male, 4 female) participated in this investigation. They were instructed to consume four 16-ounce jars of Smuckers peanut butter in four weeks such that their total daily energy intake exceeded their previous habitual intake. Body composition and total body water was assessed via the Bod Pod and bioelectrical impedance (Impedimedâ). **Results.** Subjects consumed significantly more total kcals (+268 kcals), fat (+27 grams) carbohydrate (+6 grams). There were no changes in protein consumption. Body weight (+1.1 kg), fat mass (+0.7 kg), and lean body mass increased (+0.4 kg). Total body water decreased (-0.9 liters). **Conclusion.** Daily overfeeding on fat (primarily from peanut butter) results in an increase in body weight. The increase in weight was due primarily to a gain in fat mass (64% of the weight gain) and secondarily from lean body mass (36% of the weight gain).

Evaluation of the Effect of pH on Enhancing the Sublingual Permeability of Atropine Sulfate Fast Disintegrating Sublingual Tablets (FDSTs)

Rawan Bafail, Ph.D., Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Objective. To evaluate the effect of incorporating various alkalizing agents into atropine sulfate (AS) fast disintegrating sublingual tablet (FDST) on enhancing AS sublingual permeability. **Method.** Three different pH modifiers, sodium bicarbonate, calcium carbonate, and sodium citrate, were used in two concentrations (0.5% or 1%) to evaluate their pH modification abilities. AS 8 mg FDSTs containing the optimal pH modifier were then formulated. The ex vivo diffusion of AS FDSTs were evaluated through excised porcine sublingual membranes using static Franz diffusion cells. The diffusion of AS FDSTs without a pH modifier in Mcvillian buffer pH 8 and phosphate buffer pH 6.8 were used as positive and negative controls, respectively. Samples were analyzed using HPLC-UV and the cumulative amount of AS was calculated and statistically compared using ANOVA and Tukey-Kramer Tests ($p < 0.05$). **Results.** Na Bicarb 1% resulted in mean (\pm SD) pH of 8 ± 0.2 , which was significantly higher than other pH modifiers. Also, incorporating 1% of Na Bicarb into AS FDSTs formulation resulted in similar pH values of 7.9 ± 0.1 . AS FDSTs containing 1% of Na Bicarb resulted in similar influx ($9.6 \pm 1.6 \mu\text{g}/\text{cm}^2$) and permeability ($1.2 \pm 0.2 \text{ cm}/\text{min}$) of positive controls' influx ($8.4 \pm 1.6 \mu\text{g}/\text{cm}^2$) and permeability ($1.0 \pm 0.2 \text{ cm}/\text{min}$), and significantly higher than negative controls' influx ($3.8 \pm 1.1 \mu\text{g}/\text{cm}^2$), and permeability ($0.4 \pm 0.1 \text{ cm}/\text{min}$). **Conclusion.** Incorporating a pH modifier into AS FDSTs formulation can modify the pH and enhance AS sublingual permeability 3-fold. Reducing drug ionization can be a useful approach to enhance drug permeability.

Evaluation of the Effect of Combining a Penetration Enhancer to a pH Modifier on Enhancing the Sublingual Permeability of Atropine Sulfate from Fast Disintegrating Sublingual Tablets

Rawan Bafail, Ph.D., Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Objective. To evaluate the effect of combining different permeability enhancers to a pH modifier incorporated into fast disintegrating sublingual tablets (FDSTs) on the sublingual permeability of atropine sulfate (AS). **Method.** Five FDSTs formulations of AS 8 mg containing Na Bicarb 1%, as an alkalizing agent, and a transcellular (0.5% or 1% sodium dodecyl sulfate (SDS); or 15% or 20% sodium glycholate (Na Gly), or a paracellular (16% palmitoyl carnitine chloride (PCC)) enhancers, were manufactured. AS permeability was evaluated through an excised porcine sublingual membrane. AS FDSTs with no pH modifier and penetration enhancer were used as controls. Samples were then analyzed using HPLC-UV and the cumulative amount of AS was calculated and statistically compared using ANOVA and Tukey-Kramer Tests ($p < 0.05$). **Results.** Mean (\pm SD) area under the curve (AUC_{0-90}) of cumulative drug diffused with 0.5% SDS, 1% SDS, 15% Na Gly, 20% Na Gly, and 16% PCC were statistically higher than controls. The AUC_{0-90} of AS FDSTs with transcellular enhancers (SDS and Na Gly) were significantly higher than with paracellular enhancer (PCC). Also, AS influx and permeability from AS FDSTs with transcellular enhancers were significantly higher than with paracellular enhancer and controls. Incorporating SDS 1% with Na Bicarb 1% achieved the highest enhancement in AS sublingual permeability and increased AS permeability 17-fold compared to controls. **Conclusion.** The addition of penetration enhancers along with pH modifier into AS FDST formulation significantly enhanced AS sublingual permeability. Transcellular enhancers were superior to paracellular enhancer, which suggest a transcellular passive transport mechanism for AS.

Congenital Heart Disease: Early Diagnosis to Decrease Infant Mortality

Bianca Bigley, Entry Level Nursing Student, College of Nursing, Nova Southeastern University

Kelly Z. Patino, College of Nursing, Nova Southeastern University

Sandra Herrera, College of Nursing, Nova Southeastern University

Jenane Pierre, College of Nursing, Nova Southeastern University

Kathryn Lechner, College of Nursing, Nova Southeastern University

Ashlee Suckie, College of Nursing, Nova Southeastern University

Although congenital heart diseases (CHD) can be first diagnosed during pregnancy with a fetal echocardiogram, it is more commonly diagnosed after birth. Many health care facilities have implemented different testing methods that allow the diagnosis of this condition within 24 hours of birth, thus increasing the chances of survival in newborns. As one of the objectives of Healthy People 2020, reducing the rate of infant deaths related to congenital heart defects has had an improvement of ten percent since the year of 2006 (Healthy People 2020, 2014). To maintain and perhaps increase this percentage, health care providers must be aware of the importance of early testing and recognition of signs and symptoms in newborns with CHD before being discharged from the hospital. After reviewing three different articles related to the diagnosis of CHD, we concluded that some of the most important diagnostic exams that can be done to detect this disease in a newborn are the pulse oximetry, a physical exam that highlights signs of hypoxemia, and an echocardiogram. These tests will confirm the diagnosis, and establish the type of CHD the infant presents with in order to treat him/her as soon as possible (Children's National Medical Center [CNMC], n.d.).

Atrium – Poster 14

12:15-1:15 p.m.

Perceptions of Need for Diabetes Peer-to-Peer Support in Terrier-Rouge, Haiti

Rachel Frederique Bruno, Dr. Kiran C. Patel College of Osteopathic Medicine, Public Health, Nova Southeastern University

Cyril Blavo, D.O., Director/Professor, Dr. Kiran C. Patel College of Osteopathic Medicine, Public Health, Nova Southeastern University

Patrick Hardigan, Ph.D., HPD Research, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University

Lethicia Paul, Nova Southeastern University

Objective. The goal of this study is to assess the feasibility of, and receptiveness to, a peer-to-peer intervention for diabetes self-management in Terrier Rouge. **Background.** Diabetes is a growing epidemic in Haiti, particularly among the youth. In Haiti, diabetes is typically managed in the clinical settings. In rural Haiti, diabetes management is difficult for several reasons: low priority, limited education, inappropriate nutrition, and financial barriers.

Methods. A needs assessment was conducted in this medically underserved community. A voluntary, anonymous and randomized survey was administered to 173 community stakeholders. The data was collected by trained personnel through personal interviews, and analyzed using the excel software. **Results.** Twenty-two percent of the respondents reported that they were directly affected by diabetes. The clinical setting was identified by sixty-eight percent of respondents as the preferred site for diabetes management, however, nineteen percent reported that diabetics in their community do not seek any care. Ninety three percent reported that diabetes is a serious problem, and eighty-eight percent acknowledged that their community is seriously affected by diabetes. Forty-two percent reported that diabetes was well managed in the community, and ninety-three percent stated that having educated and trained non-medical persons to assist with diabetes self-care would be extremely useful. **Conclusion.** This study suggests that there is a real concern about Diabetes in the community of Terrier Rouge, Haiti. The study paves the way to the implementation of a diabetes peer-to-peer intervention whose outcomes will be formatively and summatively evaluated.

Atrium – Poster 15

12:15-1:15 p.m.

The Effects of a Pre-Workout Supplement on Strength, Endurance and Mood

Cassandra Carson, BS, BS-ESS, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Anya Ellerbroek, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University

Corey Peacock, Ph.D., Assistant Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Tobin Silver, Ph.D., Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Jose Antonio, PhD, Assistant Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Objective. The purpose of this study was to assess the acute effects of consuming a pre-workout supplement on indices of muscular strength, endurance and mood states. **Background.** Earlier research has shown that various pre-workout supplements may aid exercise performance; however, when the placebo is matched for caffeine content with a supplement, it is not known if an ergogenic effect may occur. **Methods.** Fourteen exercise-trained subjects (7 female, 7 male) participated in this investigation. Subjects came to the lab twice with at least 7 days between testing sessions. The consumption of product or placebo was randomized. They arrived at the lab 3 hours fasted with no prior exercise that day. Subsequently, they consumed the supplement or placebo (mixed with 8-12 ounces of water) 30 minutes prior to testing. Participants' mood was also assessed via a profile mood states questionnaire (POMS) 30 minutes after product or placebo was consumed. After taking the POMS questionnaire, subjects had their exercise performance assessed via the 1-RM bench press followed by bench press repetitions to failure at 60% of 1-RM with 30 seconds rest between sets (3 total sets). **Results.** There were significant differences ($p < 0.05$) between the supplement and placebo for the number of repetitions to failure as well as total weight lifted. However, there were no differences for any of the other parameters measured. **Conclusion.** The results demonstrated that the acute consumption of a pre-workout supplement can enhance muscular endurance; however, it has no effect on strength or mood states.

Atrium – Poster 16

12:15-1:15 p.m.

In-Vitro Drug Release from Abuse-Deterrent Therapeutic Polymers

Breana N. Caturano, BA, P1, College of Pharmacy, Nova Southeastern University

Rand Ahman, College of Pharmacy, Nova Southeastern University

Christina Crum, BS, P4, College of Pharmacy, Nova Southeastern University

Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The objective was to evaluate the release of Dextromethorphan HBr (DEX) from its starch-based and cellulose-based therapeutic polymers in simulated gastric and intestinal media. **Background.** We have previously prepared DEX-loaded therapeutic polymers of crosslinked carboxymethyl derivative of cellulose (CMC) and starch (CMS), and evaluated their intravenous abuse-deterrence in different extracting solvents. Further studies were needed to confirm that such therapeutic polymers could maintain their therapeutic effectiveness under legitimate use. **Methods.** DEX-CMS/CMC complexes were mixed with binder and compressed into tablets. Using USP Apparatus II @ 50 rpm, dissolution studies were performed in two stages: Stage I (900mL 0.1N HCl), followed by Stage II (900mL water or pH 7.5 phosphate buffer). Samples of 5mL were withdrawn at predetermined time points with immediate media replacement. UV spectrophotometer was used to determine % drug release in two stages. **Results.** Immediate and complete drug release was achieved for all complexes in 0.1 N HCl (>95% after 15 minutes). Stage 2 in water and phosphate buffer showed >90% drug release after 24 hours, complying with the USP limit. **Conclusion.** Drug-loaded therapeutic polymers were found to be a successful approach in deterring intravenous drug abuse, while at the same delivering the intended drug amounts under therapeutic use. Full protonation of the polymer in gastric medium and lack of (or very slow) drug rebinding with the protonated polymer in simulated intestinal fluid makes this approach feasible in formulating both immediate and sustained release abuse deterrent opioid formulations. **Grants.** This study was supported by NSU Grant 335081.

Atrium – Poster 17

12:15-1:15 p.m.

Structural Factors Affecting Abuse Performance of Common Pharmaceutical Superdisintegrants

Breana N. Caturano, BA, P1, College of Pharmacy, Nova Southeastern University

Rand H. Ahmad, College of Pharmacy, Nova Southeastern University

Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Christina Crum, BS, P4, College of Pharmacy, Nova Southeastern University

Objective. The objective was to evaluate the abuse deterrence performance of commercial superdisintegrants, carboxymethyl cellulose (AcDiSol) and carboxymethyl starch (Explotab), to entrap cationic drug model (Dextromethorphan HBr, DEX) in solvents commonly used in IV drug abuse. **Background.** AcDiSol and Explotab (Regular, Low pH, and CLV) are crosslinked substituted cellulose and starch, respectively. We previously found out that both polymers deter drug abuse due to their binding and swelling features. Although both polymers are supplied

as sodium salt, they differ in degree of substitution and level of crosslinking, potentially affecting their deterrence performance in extracting solvents. **Methods.** DEX and CMC/CMS mixtures were prepared in different aqueous solvents. Drug concentration in solution was determined (UV Spectrophotometer). Percent of entrapment was calculated from the mass balance. Same procedure was repeated using washed Explotab CLV. **Results.** AcDiSol showed highest entrapment compared with non-washed Explotabs in polar solvents (>80% versus ~60%). Comparable results were achieved in less polar solvents or those containing ions. **Conclusion.** Higher degree of substitution significantly enhanced the deterrence capacity of cellulose and starch derivatives in polar solvents. Crosslinking had no significant effect on total drug entrapment. Ionic interferences, derived from solvents or polymers, negatively affected the entrapment efficiency. **Grants.** This study was supported by NSU Grants 335357 & 335829

Atrium – Poster 18

12:15-1:15 p.m.

Growth Suppression in Children with Frequently-Relapsing/Steroid-Dependent Nephrotic Syndrome

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E.Velis, Barry University, Miami, FL

Objective. Growth velocity rate (GR) in children with steroid-sensitive nephrotic syndrome (SSNS) is adversely affected by steroid dose and duration of therapy. Prediction of long term growth-suppression is desired. The purpose of this study was to characterize the growth of children with SSNS during the first year after diagnosis, in an attempt identify a predictor of growth suppression, in two geographically distinct settings. **Methods.** Two cohorts of pre-pubertal children (≤ 10 years of age) with SSNS treated with prednisone based on modified ISKDC protocol, 4-6 wks daily and 4-6 wks alternate day dosing, followed for at least a year, in two different settings (Romania – group 1, and USA/JDCH – group 2). Variables: relapse pattern, GR and height (Ht) SDS at 6 and 12 months. Student's t-test where applicable, significance if **p****Results.** 29 children with SSNS (age : 3.9 ± 2.4 in gr 1, 4.3 ± 1.5 in gr 2), had complete data at 12 mos, 25 at 6 mos. 14 in group 1 and 15 in group 2, 20 infrequent relapsers (IR), 9 frequent relapsing (FR)/steroid-dependent (SD) disease course. 16 Caucasians, 9 African-Americans, 4 Hispanics. Due to small sample size, in both groups combined, during the second 6-month period, GR was slower in FR/SD vs IR: 4.4 ± 2.5 vs 8.0 ± 4.9 cm/yr ($p=0.0003$), with Δ Ht SDS at 1 yr of -0.5 ± 0.7 and 0.5 ± 0.5 , respectively ($p=0.003$, $n=29$). No geographical or racial differences. **Conclusion.** Use of steroid-sparing agents needs to be considered if by one year after diagnosis catch-up growth is not seen in patients with FR/SD SSNS.

Atrium – Poster 19

12:15-1:15 p.m.

First Identification of Mutations in the Human SLC5A6 Gene Associated with Brain, Immune, Bone and Intestinal Dysfunction

Alex R. Constantinescu, MD, Professor, Dr. Kiran C. Patel College of Osteopathic Medicine, Joe DiMaggio Children's Hospital
V. S. Subramanian, UC Irvine/VA Medical Center, Long Beach, CA
P. J. Benke, Joe DiMaggio Children's Hospital, Hollywood, FL
H. M. Said, UC Irvine/VA Medical Center, Long Beach, CA

Introduction. Biotin (vitamin B7) is indispensable for normal cellular metabolism due to involvement in many critical metabolic pathways including fatty acid, amino acid and energy metabolism; it also plays a role in regulating cellular level of reactive oxygen species and gene expression, as well as normal immune function/response. Human (mammalian) cells cannot synthesize biotin endogenously; they obtain the vitamin across the plasma membrane via a carrier-mediated uptake process - human sodium-dependent multivitamin transporter (hSMVT; encoded by SLC5A6 gene); this system also transports pantothenic acid and lipoate. **Case presentation.** Using whole exome sequencing (GeneDx), we describe the first identification of two mutations in SLC5A6 gene in a young child: R94X [(CGA>TGA) c280 C>T] and R123L [(CGC>CTC), c368 G>T]. Both mutations are located in exon 3 of SLC5A6 gene. The child exhibited failure to thrive, microcephaly, brain changes, cerebral palsy, developmental delay, immunodeficiency, severe gastro-esophageal reflux, osteoporosis and pathologic bone fractures. After identification of the hSMVT mutations, he responded favorably to supplemental administration of pharmacological doses of

biotin, pantothenic acid and lipoate. Experimental characterization of the identified mutations utilizing human-derived intestinal HuTu-80 and brain U87 cell lines, showed impaired functionality (^3H -biotin uptake) of the two identified hSMVT mutants. In addition, our results (using live-cell confocal imaging) showed poor expression and cytoplasmic localization of the R94X mutant, while the R123L mutant was predominantly retained in the endoplasmic reticulum. **Conclusion.** This is the first reporting of mutations in the human SLC5A6 gene leading to defects in hSMVT, associated with a host of clinical abnormalities.

Atrium – Poster 20

12:15-1:15 p.m.

Pharmacists' Role in Minimizing the Problem of Polypharmacy

Kevin Corneille, MS, P2, College of Pharmacy, Nova Southeastern University

Objective. The purpose of this study was to take a panoramic view of potential ways HCP especially Pharmacists, can combat a problem that will not be going away for the foreseeable future. The approach taken to determine an appropriate course of action involved developing a poster focused on defining Polypharmacy and possible intervention strategies of health care providers. **Background.** The duality of medication is one of the most fascinating juxtaposition that faces healthcare providers. Medication is necessary to treat various ailments. However, the current chasm within healthcare when it relates to medication regimen and allocation is a serious public health issue. Polypharmacy involves the prescribing and consumption of many medications to treat a single ailment. In addition, such practices can lead to various adverse effects for the patient. Recent reports has shown increasing fear of over prescribing leading to underdosing. The importance of understanding Polypharmacy stems from patients who are currently at risk because of a lack of communication regarding their drug regimen. The concept of Polypharmacy is difficult to discuss because of the many moving parts involving Pharmacists and any other health care provider that interact with a patient's medication. **Methods.** A broad search was conducted using various databases such as NCBI and PubMed **Results.** The reduction of Polypharmacy through Pharmacist intervention would lead to better patient outcomes. **Conclusions:** The literature suggests there are successful pathways in which Pharmacists can intervene in Polypharmacy. Solving Polypharmacy would signal less patient adverse reactions and better patient outcomes regarding their long-term health.

Atrium – Poster 21

12:15-1:15 p.m.

Therapeutic Polymers to Deter Intravenous Drug Abuse

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Rand H. Ahmad, College of Pharmacy, Nova Southeastern University

Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. This study was conducted to determine the percentage of Dextromethorphan HBr (DEX) that could be extracted in solutions from drug-loaded therapeutic polymers (AcDiSol and Explotab) and compare to physical blends of the same. **Background.** Currently marketed intravenous abuse-deterrent formulations are either crush-resistant or extraction-resistant (by forming viscous gels in solutions), each of which abusers could manipulate. In this work, we developed a new extraction-resistant approach, using drug-loaded therapeutic polymers. The drug loads are expected to remain complexed to the polymers when drug formulations are manipulated in various solvents. **Methods.** DEX-AcDiSol/Explotab (1:8) complexes were prepared in water. The complexes were dried and milled, and amounts equivalent to 25 mg DEX were dispersed in 10 mL aqueous solutions. The % drug in solution was determined via UV spectrophotometer. The deterrence efficiency was compared to physical mixtures of the same. **Results.** Drug extraction from both therapeutic polymers was < 10% in polar solvents and 40% v/v ethanol. Solvents with ions could extract > 50% of the drug, the AcDiSol therapeutic polymer being more susceptible with ~ 80% drug extraction in normal saline. Compared to their physical blends, AcDiSol and Explotab therapeutic polymers were ~ 10% and ~ 25% more effective in reducing drug extraction in polar solvents, respectively, and ~ 35% more effective in ethanol. **Conclusion.** While therapeutic polymers of DEX-loaded AcDiSol and Explotab significantly reduced drug extraction in polar and alcoholic solutions, further work is needed to overcome their vulnerability to ions. **Grants.** This study was funded by NSU grant 335081.

Parents of Children With Autism Spectrum Disorder and Their Attitude Towards Silver Diamine Fluoride as a Different Treatment Modality for Carious Lesions

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 Judith R. Chin, D.D.S., M.S., Professor, College of Dental Medicine, Nova Southeastern University
 Jennifer D. Chung, LMFT, College of Dental Medicine, Nova Southeastern University
 Romer Ocanto, D.D.S., Professor, College of Dental Medicine, Nova Southeastern University
 Stephanie Hall, Mailman Segal Center - Pediatric and Special Needs Dental Clinic, Nova Southeastern University

Objective. The purpose of this study is to evaluate attitudes towards Silver Diamine Fluoride (SDF) for carious lesions among parents of patients receiving dental care at Mailman Segal Center for Human Development (MSC) in lieu of alternative treatment approaches. **Background.** Children with Autism Spectrum Disorder (ASD) face numerous barriers to accessing and receiving quality healthcare. Dental care in particular has been found to be an unmet healthcare need among children with ASD due to poor perceived behavior, and lack of trained dental professionals. **Methods.** Parents (N=49) of children with ASD being treated at MSC were given information about the uses of SDF. SDF acceptance was measured by mean scale scores on the 20 item SDF feasibility questionnaire; scores for each item range from 0 (low) to 3 (high); higher scores indicate higher levels of SDF acceptance. **Results.** Most patients were male N=43 (87.8%), visited the dentist at least once a year N=36 (73.4%), and 22.4% (N=11) had a cavity filled. Dental management techniques included oral sedation (N=12, 24.5%) physical restraint (N=10, 18.4%), general anesthesia (N=9, 18.3%), and nitrous oxide (N=4, 8.2%). Mean level of SDF feasibility was moderate (1.3, SD=0.69). SDF was most acceptable for use on baby back teeth (1.90), back teeth if child could not complete filling (1.84), and on back teeth if general anesthesia was required (1.65). **Conclusion.** Results indicate that parents have moderate levels of SDF acceptance. Moreover, our findings suggest that parents are more comfortable using SDF on back teeth in order to avoid use of general anesthesia. **Grants.** This study is funded by a grant from the Health Professions Division.

Peripheral Retinal Hemorrhages - When It's Not Ocular Ischemic Syndrome

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 Samantha Kayser, OD, Resident, College of Optometry, Nova Southeastern University
 Deborah I. Jessurun, OD-IV, College of Optometry, Nova Southeastern University

Introduction. Ocular Ischemic Syndrome (OIS) is usually the initial differential diagnosis when retinal hemorrhages are identified in the midperipheral or peripheral retina. The clinical presentation of OIS includes anterior and posterior segment findings, such as corneal edema, uveitis, hypotony, rubeosis and midperipheral dot and blot hemorrhages. Without anterior segment findings, a diagnosis of OIS is unlikely. Peripheral exudative hemorrhagic chorioretinopathy (PEHCR) is an uncommon, but symmetrical peripheral retinal degeneration that may vary in presentation from peripheral retinal pigment epithelial mottling, subretinal fluid or hemorrhage to vitreous hemorrhages. **Case Report.** A 79-year old white female presented with complaints of difficulty reading up close and seeing faces at intermediate and far distances. BVA was 4/16 OD, OS. DFE revealed macula geographic atrophy and isolated, midperipheral dot and blot hemorrhages OU. DFE of the periphery revealed a subretinal hemorrhage and scar due to a resolved subretinal hemorrhage OD and pre-retinal hemorrhage and scar due to a resolved subretinal hemorrhage OS. **Discussion.** Due to the overall clinical picture, we asked the patient to seek consultation with a retinologist for fluorescein angiography (IVFA), optical coherence tomography (OCT) and to determine if treatment with anti-VEGF agents was deemed necessary. **Conclusion.** Despite the low prevalence (2,100 people affected each year), clinicians usually suspect OIS when they identify midperipheral and peripheral retinal hemorrhages. PEHCR is a rare, but symmetrical retinal degeneration that may present with isolated subretinal hemorrhages in the peripheral retina. Clinicians should be aware of this rare condition and its unique clinical presentation.

Methylation and D4 Dopamine Receptors in Autism and Schizophrenia

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Natasha Rose, Nova Southeastern University

Timothy Carroll, BS, College of Psychology, Nova Southeastern University

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Objective. To evaluate the role of methylation in regulating the D4 dopamine receptor in autism and schizophrenia.**Background.** D4 dopamine receptors have the unique ability to catalyze methylation of membrane phospholipids, involving the vitamin B12 and folate-dependent enzyme methionine synthase. This process is proposed to be centrally involved in dopamine-mediated attention by synchronization of neural network activity. Impaired methylation has been reported in autism and schizophrenia. **Methods.** Levels of vitamin B12 (cobalamin) in postmortem brain samples were analyzed by HPLC. DNA methylation of CpG sites in intron 1 of the D4 receptor were measured by pyrosequencing and global DNA methylation was measured via an Elisa-based assay.**Results.** Vitamin B12 levels, especially methylcobalamin, were decreased in both autism and schizophrenia frontal cortex. Methylation of the D4 dopamine receptor was significantly higher in both autism and schizophrenia.**Conclusion.** Methylation status of the D4 dopamine receptor gene is abnormal in autism and schizophrenia, associated with lower levels of vitamin B12. **Grants.** This study was funded in part by the Autism Research Institute.**Histopathology of Neutrophil Infiltrate in the Walls of Asthmatic Airways**

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Andrew T. Mariassy, Ph.D., Professor, College of Medical Sciences, Nova Southeastern University

Stephanus E. Haryadi, Barry University

Abeny Chinkok, Barry University

Background. Bronchial asthma is an inflammatory disorder of the airways involving an array of inflammatory cells and multiple mediators. Attempts have been made to define different asthma syndromes on the basis of preponderance of specific inflammatory cells found in bronchial infiltrates. **Objective.** To make a quantitative assessment, particularly of neutrophil (poly-morpho-nuclear cell, PMN) infiltration and marginated cells in the bronchial vessels in the fast onset syndrome asthma (<1 >h). **Methods.** Lung tissue was randomly sampled at autopsy from 19 cases of asthma, and 21 control subjects (death due to non-respiratory disease). Entire cross sections of bronchi were paraffin embedded, H&E stained and with light microscope, equipped with 60X objective, neutrophil number was assessed by cell count in the lamina propria, 100-300 um depth from basement membrane (BM). The counts were expressed as # of PMNs /mm of BM length. **Results.** In fast onset asthma (<1 >h) subjects, the average number of PMNs was ten folds higher (15.26 ± 14.52 STDV) when compared to control subjects (1.14 ± 2.01 STDV). From examined cases we found that high neutrophil infiltration was not seen in all cases of the fast onset asthma, however, the higher neutrophil infiltration closely correlated with the histopathological damage of the examined airways. **Conclusion.** The neutrophil pool of both tissue emigrated and blood vessel marginated cells indicate a likely role in the pathogenesis of asthma affecting the bronchial basement membrane denudation and epithelial loss, exposing the airway surface to further inflammatory process. **Grants.** NSU Faculty Research Grant.**Potential Physiological Impacts of Eccrine Glands on Skin Tissue Dielectric Constant (TDC)**

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Harvey N. Mayrovitz, Ph.D., Professor, College of Medical Sciences, Nova Southeastern University

Objective. To clarify the physiological basis of potential eccrine gland impacts on TDC values. **Background.** TDC values largely depend on tissue water and are used to assess edema extent and changes. The effect of eccrine glands and their activation on TDC values is unknown. **Methods.** Major factors whereby eccrine glands may affect TDC values have been investigated and methods for experimental assessment of the likely dependency has been formulated. **Results.** Whole body has approximately 4×10^6 eccrine sweat glands with the forehead containing $360 \pm 50 / \text{cm}^2$ and forearm $225 \pm 25 / \text{cm}^2$. Eccrine tube length and diameter are on average 5mm and 0.02-0.05mm respectively. Sweat is composed of 99.0-99.5% water with about 75 Mm Na^+ and Cl^- thus is likely to affect TDC values in a pore-density and activation state dependent manner. Pilot measurements on forehead and forearm suggest that heat-induced sweating can elevate TDC-measured estimates of tissue water by as much as 30% and possibly more. To relate such changes to pore-density a method to measure pore-density is needed and is being developed along with a mathematical model to assess the possible range of effects **Conclusion.** The amount and content of sweat released upon activation appears to have the potential to significantly impact TDC values. The significance of this fact lies in the way such activation may confound TDC measurements aimed at detecting and tracking edema or lymphedema. The future research focus should thus be to characterize TDC value dependency in relation to measured pore-density.

Atrium – Poster 27

12:15-1:15 p.m.

Two Years on a High-Protein Diet: Much Ado About Nothing

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Objective. The purpose of these case reports was to do a follow-up investigation of five subjects on a high-protein diet over another 1-year period. **Background.** The long-term effects of a high-protein diet are not well established particularly in well-trained athletes. **Methods.** Five healthy resistance-trained men (mean \pm SD; age 30 ± 5 yr; height 177.9 ± 5.5 cm) volunteered to continue to consume a high-protein diet (>2.2 g/kg/d over another 12-month period). Subjects came to the lab every 6 months to assess body composition. Subjects continued to provide dietary self-reports via the MyFitnessPal mobile app (>150 diet recalls per year). No other instructions were given. Each subject was provided with protein powder so they could attain their protein intake goals. A basic metabolic panel was assessed in a fasted state. **Results.** Two years on a high-protein diet have no harmful effects. **Conclusion.** Consuming a high-protein diet for 2 years in resistance-trained men has no deleterious effects on liver or kidney function. Subjects also demonstrated above average bone mineral density.

Atrium – Poster 28

12:15-1:15 p.m.

Gender Related Experiences of Online Gamers

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Objective. This study was conducted to compare the gender related experiences in motivation for male and female adults who regularly engage in online gaming. It explores the variety of experiences between genders and adults of various ages. Background Much of the online gaming research focuses on the male population, providing little

research on the female perspective of online gaming (Jenson & De Castell, 2010). Consequently, the problem occurs when results from one gender of research is generalized to both populations, creating gender bias in application of study results. This generalization also lends to potential assumptions about the female online gaming population that are not necessarily accurate. **Methods.** For this study, each participant was screened over the phone and eligible participants were scheduled either for a face-to-face interview or through a video streaming interview. **Results.** Several prevalent themes consistent with our literature review were found; stress relief, achievement, socialization, immersion, and exploration. Though no major gender differences between male and female gamers and competitive habits could be discerned, motivations to online gaming varied between participant, game type, gender, and are dependent on what individuals hope to gain from playing. Some motivators pertaining to genders remain inconclusive and will continue to be explored. **Conclusion.** It was revealed through the motivational themes that people play online games due to their ability to explore and interact with game content, achievements, socialization, stress relief, as well as the personal experience gained from the game. **Grants.** This study did not require funding from any entity.

Atrium – Poster 29

12:15-1:15 p.m.

General and Mental Health of Arab-Americans Living in the United States: A Systematic Review of the Literature

Haifa Fadil, MS, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Objective. This review aims to summarize the sparse peer-reviewed literature concerned with the health of Arab Americans (AAs) in the US. **Background.** The scientific literature on AAs has been limited due to some extent to the invisibility of AAs based on their identification as “White” in Census data and elsewhere. Attention to this population has increased with current political events, yet limited research addresses the health and well-being of AAs in the US. **Methods.** a systematic review of studies published between 2008 and 2017 was conducted via PubMed and MEDLINE. The search was limited to English-language studies. Keywords used for the search included the following: Arab Americans, Middle Eastern, minor ethnicity, health, mental health and general well-being. We limited our review to these years to reflect current thinking about the relation between ethnicity and health. **Result.** The original search provided 74 publications of which 42 were excluded because they were not measuring general health or mental health outcomes. Therefore, 31 studies were included in this review. Nine studies concerned with the AAs’ general mental health outcomes. Four studies addressed depression status in AAs. Three studies mentioned anxiety and mood of this population. Post-traumatic stress disorders were measured in seven different studies. Finally, eight studies measured general health status. **Conclusion.** The paucity of published studies on the health of AAs in the US highlights the overall lack of knowledge of this population at the public health level.

Atrium – Poster 30

12:15-1:15 p.m.

Effect of Thermal History on Abuse Deterrence Performance

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Yogesh N. Joshi, Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University

Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. This study conducted to determine the effect of thermal treatment on solid methylcellulose (MC), carboxymethylcellulose (CMC), and poly(ethylene oxide) (PEO) polymers on their gel forming properties in solution state. **Background.** Heating is a common technique employed by abusers to circumvent deterrence mechanisms of abuse deterrent formulations. Heat causes long polymeric chains of PEO to break, resulting in reduced viscosity. Thus, PEO based formulations possess high risk of IV abuse when manipulated by heat such as with microwaving. **Methods.** PEO, CMC and MC (500 mg) were exposed to different heating temperatures of 80, 110, 150, and 180°C using an air-recirculated oven for 1 hr. An aqueous 2% w/v solution of the samples was prepared. Also, a control solution for each polymer was prepared using a non-heated polymer sample. The viscosities of all solutions (control and heat-treated) were measured using a cone and plate rheometer (Brookfield DV-III Ultra) at a shear rate of 300 sec⁻¹ for 40 sec. **Results.** The control solutions of MC showed lowest viscosity values. However, the PEO solutions showed lowest viscosity values under all heating treatments. Viscosity values of

CMC solutions (>150°C), were higher than maximum detection limit of the experimental set up. The MC solutions showed a gradual drop in viscosity and showed highest viscosity values (194.8 ± 1.8 cP at 180°C). **Conclusion.** Thermal history severely affects the gel formation, hence IV abuse of PEO. MC and CMC show relatively stable viscosities, as such may prove more beneficial as an abuse deterrent agent than PEO alone.

Atrium – Poster 31

12:15-1:15 p.m.

Effect of Temperature on Gelation Properties of Cellulose Derivatives

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Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The study was conducted to determine gelation properties of methyl cellulose (MC), and carboxymethylcellulose (CMC) in comparison with poly(ethylene oxide) (PEO) when subjected to near-boiling temperatures during abuse. **Background.** PEO-based abuse deterrent formulations can become vulnerable due to physicochemical changes that occur in solid and solution states of the polymer when subjected to heat. Cellulose derivatives, whose viscosities are minimally affected and gelation properties are enhanced at high temperatures can be beneficial. Therefore, in this study, we characterized these properties at near-boiling extraction temperatures. **Methods.** A texture analyzer (Brookfield, CT3) was used to measure the gel strength of PEO, CMC and MC solutions (0.5, 1, 2, 2.5, and 5% w/v). Each polymer sample solution was poured into a jacketed beaker maintained at 90°C. After 5 min, gel strength was measured by allowing the texture analyzer probe to travel into the sample to 10 mm at a speed of 1 mm/sec. As the probe moved into the sample, the resistance (measured in mN) exercised by the sample was recorded. **Results.** PEO solutions showed the maximum gel strength of 196 mN (5% w/v) at room temperature, which was decreased to 76.6 mN at high temperature. MC (5% w/v) solution displayed lowest gel strength at room temperature, whereas at high temperature, it showed the highest gel strength of 1049 mN. **Conclusion.** At elevated temperatures, where PEO and CMC solutions lose their integrity, the MC solution become strong due to thermo-gelation. Therefore, combinations of such polymers can be helpful in maintaining deterrence performance at low and elevated temperatures.

Atrium – Poster 32

12:15-1:15 p.m.

Perceptions of Need for School Nutrition Intervention for Impoverished Inner-City Youth in Accra, Ghana

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Cyril Blavo, D.O., Director/Professor, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University
Patrick Hardigan, Ph.D., HPD Research, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University
Jemima Arolasafe, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University

Objectives. The objectives of this study were to: (1) Identify the needs and access to school breakfast for children in Accra, Ghana;(2) Determine the perceptions of the teachers and parents on the need and benefit of school breakfast. **Background.** An estimated 200 billion people worldwide are deficient in key micronutrients, resulting in 1 in 4 children globally who are stunted and who will not reach their full physical or cognitive potential. In developed nations, such circumstances have been resolved through school meal programs. Developing nations continue to face the challenge. **Methods.** Surveys were administered to parents of school children and teachers in Accra, Ghana. The surveys gathered information on parents' perceptions of the need for school breakfast, and teachers' perceptions of the impact of breakfast on students' ability to learn. **Results.** Of the 465 parents surveyed, 95% reported that breakfast is important for their children. However, 37% admitted that they cannot afford to feed their children adequately. Of the 26 teachers surveyed, 92% reported that the ability of their students to learn is diminished among those who attend school without breakfast, while 100% reported that all students would benefit academically if breakfast was provided free of charge. **Conclusion.** This study provides an impetus for the development of a school breakfast program for the impoverished inner-city youth in Ghana, with the anticipation of enhancement in school performance.

Assessment of Need for Access and Affordability of Medication in an Underserved Population in Ghana

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Esther Acherekoh, B.Pharm, College of Pharmacy, Kwame Nkrumah University of Science and Technology

Background. Subsidized medication programs for disadvantaged communities in Ghana are either unreliable or non-existent. Due to a high cost of medicines, low-income earners have higher rates of non-adherence to medication therapy, resulting in poor health outcomes. There is a perceived need for access to medications in rural communities of Ghana. **Objective.** This study sought to identify community needs relating to cost and availability of essential medications. **Methods.** Randomly selected community members of Ejisu, Ghana, were surveyed on their income levels, access to essential medicines and opinions on affordability of medicines. Pharmacists surveyed provided input on developing a community-based drug formulary and factors influencing medication adherence. Quantitative data analyses was performed using descriptive statistics. **Results.** Among 201 community respondents, 70% were female and 63% were between the ages of 18 and 40. Approximately 62% reported either primary or junior high school as the highest educational level attained, whereas 20% had no formal education. The monthly household income level reported by 61% of respondents was less than 100 cedis (\$25) a month. While 14% reported that they could only afford to purchase daily quantities of medication, 86% admitted that discounts would make medications affordable. Of 85 pharmacists surveyed, 94% identified a need for a community-based drug formulary for hypertension, diabetes and malaria. Approximately 95% of them agreed that subsidized medications would improve adherence. **Conclusion.** The study findings justify a need for strategies to enhance affordability and access to improve adherence and health outcomes in Ejisu, Ghana.

Improving Medication Adherence with a Pharmacist--Led MTM Clinic in the Primary Care Setting

Genevieve Hale, PharmD, Assistant Professor, College of Pharmacy, Nova Southeastern University

Nemesis Merly, College of Pharmacy, Nova Southeastern University

Objective. The purpose of this study is to assess medication adherence and HEDIS STAR Ratings in patients using ACE inhibitor/ARB, statins and/or anti-diabetic medications through pharmacist-led Medication Therapy Management (MTM) in an accountable care organization. **Background.** Previous studies show improved clinical outcomes through MTM due to improved medication adherence. Additionally, literature demonstrates that involving pharmacists further improves outcomes due to their expertise and capability to properly counsel patients on their medications. HEDIS STAR Measures is a tool used to measure adherence and it ranges from 1-5 stars (lowest to highest). **Methods.** In this retrospective cohort study, data were collected via chart review of pharmacist-led MTM patient interviews and follow-ups between October 2015 and April 2017. Eligible patients for this study must be at least 18 years of age and have at least one chronic disease state, for which they take ACE inhibitor/ARB, statin or diabetic medication. **Results.** A total of 118 patients were referred to MTM clinic, which resulted in a total of 115 interventions (1:1 ratio of intervention to patient). Out of the 118 patients, 36 had a follow-up visit, resulting in 47 interventions (1.3:1). Prior to MTM clinic, most STAR ratings were 3. Post-MTM clinic, most ratings were 4's or 5's across all medication categories. **Conclusion.** Having a pharmacist-led MTM clinic in the primary care setting helps improve medication adherence and HEDIS STAR ratings in patients with chronic conditions. **Funding.** None

Attitudes and Knowledge with Participation in an Integumentary Interprofessional Simulation Experience Between Nursing and Physical Therapy Students

Heather Hettrick, Ph.D., Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Shari Rone-Adams, DBA, Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Sarah Koplou, Ph.D., Assistant Professor, College of Nursing, Nova Southeastern University

Lisa Soontupe, Ed.D., Associate Professor, College of Nursing, Nova Southeastern University

Melissa Morris, MSN, Clinical Manager of Human Patient Simulation and Skills Lab, College of Nursing, Nova Southeastern University

Archana Vatwani, DPT, Assistant Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Objective. The objective of this study was to understand nursing and physical therapy students' attitudes and knowledge of other disciplines before and after participation in an integumentary simulation experience.

Background. Integrating interprofessional experiences early in healthcare professional programs is crucial to ensuring effective collaboration and communication in the clinical setting.

Methods. 1st year Doctoral of Physical Therapy (DPT) and 1st year Bachelor of Science in Nursing Students (BSN) participated in a simulated clinical experience for an acute care patient with diabetes mellitus and a foot wound. Working together the BSN students performed a physical assessment, education, and appropriate nursing interventions. DPT students performed a skin/wound assessment, suggested offloading/pressure redistribution/shoe wear recommendations, assessed functional limitations/impairments, and planned appropriate PT interventions. Students completed a pre and post-test survey consisting of the Readiness for Interprofessional Learning Scale (RIPLS) and several short answer questions. **Results.** Ten BSN and 49 students participated in the experience. The following questions on the RIPLS had statistical significance on a paired samples t-test ($p < .05$): shared learning with other healthcare professionals' increases ability to understand clinical problems, learning with healthcare students would improve relationships after graduation, shared learning helps clarify the nature of patient problems and I would welcome opportunities for interprofessional learning. Short answer responses indicated that students learned about the scope of practice and recognized the potential to benefit the patient, improved communication, and fostering teamwork through collaboration. **Conclusion.** Students showed increased knowledge of the other profession and appreciated the opportunity for interprofessional learning. **Grants.** N/A

Various Learning Styles and Approaches Among Pharmacy Students Utilizing VARK

Marina Ishak, PharmD, Instructor, College of Pharmacy, Nova Southeastern University

Rochelle Nappi, Ed.D., Assistant Dean of Operations, College of Pharmacy, Nova Southeastern University

Nethania Thelemaque, P2, College of Pharmacy, Nova Southeastern University

Elizabeth Sturman, P2, College of Pharmacy, Nova Southeastern University

Objective. The study was conducted to determine the preferred learning style of second year pharmacy students using the visual, aural, read/write, and kinesthetic (VARK) questionnaire. **Background.** Professional degree programs are challenging because the application of content requires a higher level of thinking to properly grasp concepts and theories. Students are tasked with learning a large amount of information in a limited amount of time and must be sure they are interpreting and applying information in a correct manner. It is important for students to be knowledgeable of their learning style in order to academically excel. **Methods.** The self-administered VARK assessment tool was disseminated among second year pharmacy students at Nova Southeastern University College of Pharmacy at the Palm Beach Campus. **Results.** A total of 25 students participated. The majority (40%, $N=10$) of participants were kinesthetic learners followed by 36% ($N=9$) who preferred to learn by reading/writing. 6 students (24%) preferred visual aids, while only 5 (20%) were aural learners. Although a total of 25 students took the VARK assessment, five students had a dominant learning style in more than one VARK category. **Conclusion.** The aim of this study was to explore the diverse learning approaches that pharmacy students possess. Pharmacy students

approach their learning in a variety of ways as identified through the VARK assessment. **Grants.** The study was not funded by any party.

Atrium – Poster 35

12:15-1:15 p.m.

Health, Exercise, and Sexual Dysfunction: A Comparison of Men and Women

Lia M. Jiannine, Ph.D., Assistant Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Background. Obesity and inactivity have led to an increasing number of individuals with sexual dysfunctions (43% of women; 31 of men). Small bouts of exercise can drastically improve sexual functioning. Thus, the present study is designed to examine the effects of physical fitness and self-concept on sexual functioning. **Subjects and Methods.** Fitness assessments and questionnaires were administered to 133 participants between the ages of 18 - 50. Physical fitness was assessed through body composition, cardiovascular endurance, muscular strength and muscular endurance. Self-concept was presented a total self-concept score and as six individual concepts of self. Sexual function was presented as both an aggregate score and five separate constructs of sexual functioning - fantasy/cognition, arousal, orgasm, behavior/experience, and drive/desire. **Results.** The results indicated that sexual behavior/experience was predicted by body fat percentage. In men, fantasy was related to total self-concept, sexual behavior/experience was related to likeability. In women, arousal was predicted by cardiovascular endurance. Total self-concept was related to both orgasm and sex drive/desire. Power and muscular strength were significantly related to number of sexual partners in women but not men. **Conclusions.** The present study adds to the growing body of evidence indicating a positive relationship between physical fitness and sexual health. Individuals with sexual dysfunctions, particularly women, who are not persuaded by the currently publicized benefits of physical activity, may be inclined to exercise to improve sexual functioning.

Atrium – Poster 36

12:15-1:15 p.m.

Minimizing Drug Extraction via Simultaneous Binding and Coagulation

Yogesh N. Joshi, Ph.D., Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University
Riann Forbes, PI, College of Pharmacy, Nova Southeastern University
Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The study was conducted to determine the combined effect of binding and coagulation on drug extraction from a bentonite drug dispersion. **Background.** Previously, our laboratory has shown the successful use of bentonite clays to prevent drug extraction for IV abuse due to its complex formation with cationic drugs. In this work, we have enhanced the deterrence capacity of bentonite clays by coagulating the bentonite particles during the extraction process. **Methods.** A suspension was prepared by dispersing calcium bentonite (50, 75, and 100 mg) into a 10 mL solution (2.5 mg/mL) of dextromethorphan HBr (DMX), followed by an addition of 2 mg of PEO. Non-coagulated (control) samples were also prepared in a similar way without addition of PEO. All samples were analyzed by a UV-spectrophotometer at a wavelength of 271 nm. The % of drug entrapped was measured indirectly from the amount remaining in the filtrate. The amount of filtrate recoverable after dispersion of bentonite clay with and without coagulant was measured using a graduated cylinder. **Results.** A higher % of drug entrapped within coagulated clays in all dispersions compared to the control. As the amount of clay in the drug solution was increased, about 5-6.5 % increase in drug entrapment was observed. With the dispersed system, the recoverable filtrate volume was 9.4 mL whereas, the recoverable amount of filtrate was 8.6 mL for the coagulated system. **Conclusion.** The coagulation process affected the drug extraction process by causing around a 6% increase in drug entrapment and an 8% decrease in solvent recovery compared to a non-coagulated dispersed clay system.

Determining Syringeability by Measuring Aspiration Volume of Polymer Solutions at Different Temperatures

Yogesh N. Joshi, Ph.D., Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University
Riann Forbes, P1, College of Pharmacy, Nova Southeastern University
Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The study was conducted to determine syringeability of methyl cellulose (MC), carboxymethyl cellulose (CMC), and poly(ethylene oxide) (PEO) in terms of aspiration volume when subjected to different temperatures for abuse. **Background.** Despite the fact that synthetic gelling agents such as PEO are frequently used in deterring drug abuse via injection, solution properties of such polymers are sensitive to high temperatures of extraction, and as such less temperature sensitive gelling agents are highly demanded. **Methods.** A CT3 Texture Analyzer with a syringe probe was used to draw PEO, MC and CMC solutions (0.5, 1, 2, 2.5, and 5% w/v) into the syringe. The syringe plunger was attached to the probe, and the needle was immersed into the solution. The probe was pulled up to 40 mm mark at the speed of 0.5 mm/sec. A similar study was conducted at an elevated temperature. The polymer solutions were poured into a jacketed glass beaker attached to a water bath maintained at 90°C. The aspiration volumes were measured after 5 min. **Results.** At room temperature, aspiration volumes suggested greater difficulty level of the CMC solutions for syringeability compared to MC and PEO solutions. However, at elevated temperatures, aspiration of MC solutions did not lead any volume. The PEO solutions had lowest resistance for aspiration in both conditions. **Conclusion.** Aqueous solutions of cellulose derivatives, CMC and MC show better resistance toward syringeability than PEO solutions at room temperature as well as at elevated temperatures.

Effect of Shear Stress History on Polymer Solution Aspiration

Yogesh N. Joshi, Ph.D., Ph.D. in Pharmacy Student, College of Pharmacy, Nova Southeastern University
Riann Forbes, P1, College of Pharmacy, Nova Southeastern University
Hamid Omidian, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. The study was conducted to determine behavior of methyl cellulose (MC), and carboxymethyl cellulose (CMC) in comparison with poly(ethylene oxide) (PEO) when subjected to shear stress for prolonged duration. **Background.** Use of gel forming agents in abuse deterrent formulations can potentially prevent drug abuse via IV route. However, these agents are susceptible to high shear conditions of multiple aspirations, which for the first time will be studied in this research. **Methods.** About 3 mL of 1% w/v solutions of PEO, CMC, and MC were taken into glass vials. A Brookfield CT3 texture analyzer with syringe probe was used to measure the drawing force. The syringe plunger was attached to the probe while the attached needle was immersed into the solution. The solution was drawn up into the syringe to the 3 mL mark by pulling the syringe plunger up using the probe. The probe was then pushed down to release the solution into a glass vial and was pulled up again. This procedure was repeated 15 times, and the pulling force was recorded. **Results.** This test shows that the syringeability of the PEO solutions is susceptible to their stress history. With increasing number of aspiration cycles, PEO solutions showed gradual decrease in drawing force, whereas the drawing force was increased for the MC solutions. Drawing force for the CMC solutions remained relatively unchanged. **Conclusion.** MC and CMC provide a feasible solutions to susceptibility of abuse deterrent formulations to shear stress.

Prescriber Perceptions of Clinical Pharmacists Within Alternative Payment Models: A Report from ACORN SEED (Accountable Care Organization Research Network, Services and Education)

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Hong Nguyen, P4, College of Pharmacy, Nova Southeastern University
Monica Tadros, P4, College of Pharmacy, Nova Southeastern University
Tina Joseph, PharmD, Assistant Professor, College of Pharmacy, Nova Southeastern University

Objective. The purpose of this cross-sectional study is to evaluate the perception of clinical pharmacists by prescribers within a primary care-based ACO. **Background.** The Alternative Payment Model (APM) is a payment approach that incentivizes high quality patient care. It includes the Medicare Shared Savings Program and the Next Generation Accountable Care Organization (ACO) Model. Within primary care-based, clinical pharmacists are in an ideal position to manage multiple aspects of patient care. **Methods.** A qualitative, anonymous survey consisting of seventeen items divided into four domains was created and disseminated electronically and/or by hand to prescribers within two Accountable Care Organizations in South Florida. Survey construction was performed utilizing information retrieved during the literature search as well as consulting the expert opinions of current pharmacists who work within the APM models. The survey was then given to six pharmacy faculty, two physicians, one Director of Quality Improvement who work within the ACO model to screen for readability. **Results.** 11 prescribers completed the survey with 81.8% of prescribers having had the opportunity to collaborate with clinical pharmacy services. Overall, prescribers were more likely to refer patients with chronic conditions to clinical pharmacy services. Almost all of the prescribers who took the survey believed clinical pharmacists help to improve patient quality outcomes (90.9%). However, 5 of 11 (45.5%) surveyed prescribers felt comfortable signing a Collaborative Practice Agreement (CPA) with a clinical pharmacist. **Conclusion.** Although clinical pharmacists were perceived as having high value in the ACO setting, many prescribers were not comfortable signing a CPA.

Atrium – Poster 40

12:15-1:15 p.m.

Evaluation of the Cytotoxic Profile of Metformin and Y15 in Platinum Resistant Ovarian Cancer Cells

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Arkene Levy, Ph.D., Associate Professor, College of Medical Sciences, Nova Southeastern University

Appu Rathinavelu, Ph.D., Professor and Director, Rumbaugh Goodwin Institute for Cancer Research, Nova Southeastern University

Keerthi Thallapureddy, Halmos College of Natural Sciences and Oceanography, Nova Southeastern University

Objectives. This study evaluated the combined cytotoxic efficacy of metformin and the focal adhesion kinase (FAK) inhibitor Y15, in platinum resistant OVCAR3 ovarian cancer cells. **Background.** In previous studies, we demonstrated that metformin, an antidiabetic drug, induces cytotoxicity in platinum resistant ovarian cancer cells. Increased phosphorylation of FAK, a tyrosine kinase, is implicated in the development of this platinum resistance. We therefore evaluated the ability of metformin to enhance FAK inhibition in vitro. **Methods.** Cells were treated with Y15 (10-100 μ M) and metformin (10-100Mm) separately, to determine IC₁₀ values which were used for combination protocols (Y15 20 μ M + Metformin (10Mm). Following treatment, DNA fragmentation and poly ADP ribose polymerase (PARP) cleavage assays were used to evaluate mechanisms of cell death. Total and phosphorylated FAK, p53, p21, and BAX expression were also assessed using western blot. **Results.** Y15 significantly increased the efficacy of metformin compared to metformin only. Apoptotic cell death was confirmed by PARP cleavage and DNA fragmentation. Combination treatment with metformin and Y15 downregulated phosphorylated FAK expression, confirming reduced FAK activity. Reduced FAK phosphorylation correlated with increased expression of pro-apoptotic markers p53, p21 and BAX. **Conclusions:** Y15 enhances the cytotoxic profile of metformin in platinum resistant OVCAR 3 cells. This study is the first to report a FAK dependent cytotoxic mechanism of metformin in ovarian cancer. In further work, we will explore the mechanisms by which metformin increases Y15 mediated FAK inhibition. **Grants.** The authors thank the Royal Dames Inc. Ft. Lauderdale for financial support.

Atrium – Poster 41

12:15-1:15 p.m.

Dysfunctional Movement Patterns Differ Between Male and Female NCAA Division II Athletes

Daniel Klahr, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Monique G. Mokha, Ph.D., Director/Associate Professor, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Objective. This study was conducted to determine differences in dysfunctional movement pattern frequency, as measured by a score of “1” on the Functional Movement Screen (FMS) between male and female collegiate athletes. **Background.** The FMS consists of 7 tests (scored 1-3 on proficiency) assessing foundational patterns such as

stepping, lunging, and squatting. FMS proficiency has been associated with injury risk as well as in-season performance level. Sex differences in FMS scores exist in high school athletes with males scoring higher in the trunk stability push-up (TSPU) test. Differences have not been investigated in collegiate athletes. Results may aid sports medicine professionals in implementing injury prevention strategies. **Methods.** 275 NCAA Division II intercollegiate athletes (18-27 years; males, n=118; females, n=157) representing 15 teams were FMS assessed during their 2017-2018 pre-participation examinations using standardized procedures. Pearson Chi-square analyses were conducted to examine potential differences in the frequency of “1s” on the 7 tests between sexes, $p < 0.05$. **Results.** Significant differences were found in 4/7 tests. Males showed greater dysfunction in the Shoulder Mobility ($\chi^2 = 10.821$, $p = 0.001$) and the Active Straight Leg Raise ($\chi^2 = 4.034$, $p = 0.036$). Females showed greater dysfunction in the Hurdle Step ($\chi^2 = 4.610$, $p = 0.033$) and Trunk Stability Push-up ($\chi^2 = 84.347$, $p < 0.001$) **Conclusion.** Significant differences exist in movement pattern dysfunction between the sexes in collegiate athletes. Males had more scores of “1” in tests requiring mobility while females had more in tests requiring stability. Further research should be done to determine the causality of these differences. **Grants.** This study was not funded.

Atrium – Poster 42

12:15-1:15 p.m.

A Rare Case of Bilateral Tibial Tuberosity Avulsion in an Adolescent Male

Vinicius Knabben, MD, Kendall Regional Medical Center

Moshe Yatzkan, Kendall Regional Medical Center

Antoinette Golden, Kendall Regional Medical Center, FIU Herbert Wertheim College of Medicine

Introduction. Tibial tubercle fractures are rare, with one bilateral tubercle fracture reported among 21 case reports. **Case presentation.** A 14-year old Latino male arrived from a trampoline park with bilateral knee pain after landing with his knees in flexion. Physical exam demonstrated an overweight adolescent male with marked swelling and tenderness of his knees, unable to tolerate passive range of motion from a flexed position. The compartments remained soft, with sensation and pulses intact. Orthopedics emergently admitted the patient to the operating room where closed reduction under fluoroscopy was performed. The patient returned to the OR for open reduction and internal fixation to optimize approximation and was discharged a few days later. **Deviation From the Expected.** This is the first reported bilateral tibial tuberosity fracture that extends to the posterior cortex. **Discussion.** A simple avulsion fracture of the tibial tuberosity represents less than 1% of pediatric fractures, with only 21 bilateral fractures reported in published case reports. The injury is most common in males age 12-15 and occur at the ossification center. Treatment generally requires open reduction and internal fixation. Outcomes are good with frequent return to full activity. Given the marked swelling ED management must be focused on compartment syndrome. **Conclusion.** Tibial tubercle fractures are rare, with this case representing the first bilateral tubercle fracture with extension to the posterior cortex being reported in the literature. The diagnosis is imperative to ensure definitive treatment, optimal range of motion, and reduction of the fracture at the growth plate.

Atrium – Poster 43

12:15-1:15 p.m.

A Method to Detect Lower Extremity Edema with Possible Application to Congestive Heart Failure (CHF)

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Andrea Alvarez, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University

Harvey N. Mayrovitz, Ph.D., Professor, College of Medical Sciences, Nova Southeastern University

Objective. This study was developed to obtain tissue dielectric constant (TDC) reference values in healthy individuals as a first step to further aid in the early detection of lower extremity edema due to congestive heart failure. **Background.** In the US about 550,000 new cases of CHF occur per year often with lower extremity edema. Once edema is visually observed the causative process is usually well established. However, there is no method that can conveniently detect the early and potentially insidious changes in fluid content of these regions. **Methods.** For this study skin tissue dielectric constant (TDC) was measured at 300MHz as a direct index of skin tissue water at arm, hand, lower leg and foot bilaterally in self-reported healthy persons of various ages. Parameter indicators were the ratio of the lower extremity to upper extremity TDC value. These included foot dorsum/forearm (FF), foot dorsum/hand (FH), medial leg/hand (LH) and medial leg/forearm (LF). **Results.** A total of 44 subjects encompassing

88 ratios for each parameter have been evaluated to tissue depths of 0.5 mm and 2.5 mm. Results for participants who were under age 30 showed that the FF ratio determined for a depth of 2.5 mm was 1.003 ± 0.146 (mean \pm SD). **Conclusion.** Present findings suggest that using a 2SD threshold and based on the under 30 data, a measured FF ratio greater than 1.300 in an individual would be taken as an indication of the presence of lower extremity edema. This threshold may subsequently be refined pending further data.

Atrium – Poster 44

12:15-1:15 p.m.

Determination of Shark and Ray DNA Nucleotide Excision Repair Gene Homology and Gene Expression Compared with Humans

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Schaefer Grant, NSU USchool, Nova Southeastern University

Jean Latimer, Ph.D., Affiliate Associate Professor, College of Allopathic Medicine, Nova Southeastern University
David Kerstetter, Halmos School of Natural Science and Oceanography, Nova Southeastern University

Objective. Determine the extent of homology and gene expression between elasmobranch and human DNA Nucleotide Excision Repair (NER) genes. **Background.** Shark and Ray species have lifespans that range from 3-350 years. DNA repair capacity has been correlated with the length of life from vertebrate species that live on land. For the first time a study of DNA repair gene homology and expression will be performed on sharks and rays. We hypothesize that these species will show significant homology in NER genes with human. We further hypothesize that the expression of NER genes will correlate with the lifespan of the species. **Methods.** RNA sequencing is being used to determine the extent of gene expression in each species and the sequence of the exons in each of the 20 canonical NER genes. **Results.** Elasmobranch NER genes have never been studied. Results are currently being assessed using a skate and an elephant shark reference genome to assess RNA sequencing data from 3 nurse sharks and 3 yellow rays for the identification of the NER genes from shark and ray samples. Homologies to human are forthcoming as well as gene expression data. **Conclusion.** The NTA breast represents a preneoplastic stage in breast carcinogenesis. Two different types of NTA have been identified with regard to DNA repair. **Grant.** PFRDG funded 2017 (Kerstetter).

Atrium – Poster 45

12:15-1:15 p.m.

Drowning Awareness

Emily M. Martinez Malo, Entry Level Nursing Student, College of Nursing, Nova Southeastern University
Dionna Anderson, College of Nursing, Nova Southeastern University
Briana Hutchinson, College of Nursing, Nova Southeastern University
Sabrina Irfan, College of Nursing, Nova Southeastern University
Frantz Murose, College of Nursing, Nova Southeastern University
Alexandra Cisneros, College of Nursing, Nova Southeastern University

Drowning is respiratory impairment resulting from fluid engulfing the airway halting ones breathing. There are two common forms of drowning known as dry drowning and near drowning. Dry drowning involves water being found within ones lungs without being under water. This form of drowning occurs twenty-four hours after swimming. Near drowning is the process of almost dying due to being submerged under water. Incidences of drowning continue to rise within the healthcare field especially amongst children. The American National Red Cross provides a guideline to help limit the amount of risks for drowning. Many times when children have been involved in drowning is due to lack of knowledge about proper ways to swim. Also, encompassing a lack of supervision. Nurses play a vital role in providing the utmost care for children who have been involved in a drowning incident. Providing proper education about swimming and ways to minimize the risk for drowning can reduce the amount of drowning occurrences. Overall, drowning continues to be on the rise and needs to be properly addressed by health care professionals to reduce the amount of fatal and non-fatal drowning events.

Conditional Knockout of Polarity Complex (Atypical) aPKC Reveals an Anti-inflammatory Function Mediated by NF- κ B

Anastasia Mashukova, Ph.D., Assistant Professor, College of Medical Sciences, Nova Southeastern University
Pedro J. Salas, University of Miami

Objective. This study was conducted to investigate anti-inflammatory role of atypical PKC (aPKC) in the intestinal epithelium. **Background.** Inflammatory Bowel Disease (IBD) is a complex multi-causal condition arising from a combination of genetic predisposition and environmental challenges by intestinal bacteria. The intestinal epithelium constitutes the essential barrier against the potentially damaging factors and agents which exist in the gut lumen. It has been established that in IBD multiple proinflammatory cytokines, including TNF alpha, signal on the intestinal epithelium causing activation of the innate immunity pathways such as NF- κ B. In turn, these pathways cause disassembly of the tight junctions and permeabilization of the intestinal barrier resulting in persistent inflammation. Our interest in the possible role of aPKC in inflammatory pathways was sparked when we observed that aPKC was deeply down-regulated in intestinal epithelia in samples from IBD patients. **Methods.** We used aPKC^{flox/flox} mouse to obtain a conditional knockout in intestinal epithelia. We were able to achieve full aPKC down-regulation in small intestine villi and colon surface epithelium. **Results.** The results show that aPKC is dispensable for polarity after cell differentiation. At the same time aPKC defect resulted in increased NF- κ B activity and elevated expression of proinflammatory cytokines. In contrast, expression of anti-inflammatory IL-10 decreased. **Conclusion.** We conclude that epithelial aPKC acts upstream of multiple mechanisms that participate in the inflammatory response in the intestine, including, but not restricted to, NF- κ B. **Grants.** This study was partially funded by a President's Faculty Research and Development Grant to A. Mashukova.

Characterization of the Tissue Dielectric Constant of Skin Basal Cell Carcinoma

Harvey N. Mayrovitz, Ph.D., Professor, College of Medical Sciences, Nova Southeastern University
Paige Spagna, OMS-II, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University
Luke Killpck, D.O., St. Josephs Mercy Livingston Dermatology Residency Training Program, PGY-III
Stuart Gildenberg, MD, St. Josephs Mercy Livingston Dermatology Residency Training Program, Faculty
David Altman, MD, St. Josephs Mercy Livingston Dermatology Residency Training Program, Faculty

Objective. To characterize the tissue dielectric constant (TDC) of basal cell carcinoma (BCC). **Background.** In vitro dielectric constant measures of cancerous-tumors have shown differences compared to non-cancerous tumors. But, TDC values of BCC in vivo has not been characterized. **Methods.** In 30 patients, TDC of skin lesions to be biopsied was measured prior to biopsy at 300 MHz via the open ended coaxial line method to a depth of 0.5 mm. Lesion measurements were compared to values on non-affected skin. Patient age (mean \pm SD) was 71.9 \pm 15.5 (35-95 years) with 19 males and 11 females included. **Results.** Biopsy results showed BCC for all 30 lesions of which 2/3 were classified as nodular and 1/5 as infiltrative. TDC values measured on lesions were overall significantly less than measured on contralateral non-affected skin (22.1 \pm 15.7 vs. 37.4 \pm 14.3, $p < 0.0001$). However, in four cases TDC values were greater on the lesions. These tended to be lesions that were either ulcerated or edematous. However, initial preliminary comparisons of measurements on non-cancerous lesions (n=10) indicate that average percentage differences between lesions and control skin are about 40% for both cancerous and non-cancerous lesions. **Conclusions.** Although significant differences in TDC values are found between BCC skin lesions and non-affected skin, the fact that there is so far, no clear separation between cancerous and non-cancerous differences, cautions that TDC measurements may have inadequate selectivity as a useful detection method. An increase in the number of non-cancerous lesion comparison measurements may provide further insight into this issue.

Stay Connected With Your Baby in the Neonatal Intensive Care Unit (NICU)

Linda McCash, Ph.D., Associate Professor, College of Nursing, Nova Southeastern University
Andrea Barth, BSN Nursing Student, College of Nursing, Nova Southeastern University

Meagan Bohl, BSN Nursing Student, College of Nursing, Nova Southeastern University
Tiffany Olsen, BSN Nursing Student, College of Nursing, Nova Southeastern University
Shavonne Howes, BSN Nursing Student, College of Nursing, Nova Southeastern University

Objective. To introduce Skin-to-Skin Care (SSC), also known as Kangaroo Care, which is the method of holding an infant in an upright and prone position, skin-to-skin, on the parent's chest for a length of time. Blankets or clothing are wrapped around the infant to provide security, similar to a kangaroo pouch (Skin to Skin, 2016). This life-saving nursing intervention within the NICU promotes infant well-being and enhances positive infant outcomes.

Background. Skin-to-Skin Care (SSC) is a beneficial holistic nursing care provision for sick or preterm infants requiring hospitalization in NICU. Healthcare research reports many stabilizing benefits to include regulation of physiological responses (Skin to Skin, 2016). Despite all the evidence based research confirming that SSC significantly benefits the newborn, there are multiple barriers to nurses implementing SSC in the NICU. **Results.** The preterm infant benefits from this intervention with positive outcomes such as regulation of heart rate and respirations; temperature; sleep; irritability and immune system. In addition, it shortens neonatal length of hospital stay, reduces morbidity, improves tolerance to pain, and improves body weight and physical growth. Notably, nursing students identified an innovative product, called the BabyBe System, which simulates SSC for the neonate when NICU nurses and parents cannot provide sustained SSC. The BabyBe device is a bionic gel mattress that allows the baby to feel their caregiver's breathing, heartbeat, and even voice or music although they are not present.

Conclusion. Overall, the review of literature on Skin-to-Skin Care (SSC) supports the identified evidence-based guideline promoting SSC. The benefits for the high-risk infants, and infants receiving palliative care in the NICU, far outweigh the risks according to research literature and various clinical barriers to integration of this holistic nursing care must be overcome. The BabyBe System, an innovative and effective simulation of SSC for the infant, is recommended for use in the United States.

Presenting in Ft. Myers

12:15-1:15 p.m.

Take Control of Your Anxiety Before It Controls You

Linda McCash, Ph.D., Associate Professor, College of Nursing, Nova Southeastern University
Tiffany Olsen, BSN Nursing Student, College of Nursing, Nova Southeastern University
Andrea Barth, BSN Nursing Student, College of Nursing, Nova Southeastern University
Meagan Bohl, BSN Nursing Student, College of Nursing, Nova Southeastern University

Objective. To educate individuals and patients about anxiety/stress and how the central nervous system reacts to perceived anxiety. An individual's level of anxiety is dependent on their response to the anxiety provoking stimulus in the environment. Various approaches to management of anxiety, life-style and health promotion can decrease the impact of anxiety on one's overall well-being. Evidence-based techniques/interventions are presented via this informative poster. **Background.** Anxiety is a diffuse apprehension vague in nature and is associated with feelings of uncertainty and helplessness. Anxiety does not discriminate and can affect any individual regardless of ethnicity, socioeconomic status, level of education, culture, or healthcare beliefs. It tends to be higher in women than men and can either be generalized (happens daily) or compartmentalized in the form of acute panic. Mild anxiety can be considered a good thing and can increase motivation and arousal when competing or taking an exam. When moderate levels are reached it becomes concerning and can impact one's ability to function at optimum levels. Any internal or external trigger in our day to day life can cause anxiety. When an individual's response is overly exaggerated or heightened compared to another person's perception of a stimuli in the environment, an individual may be diagnosed with an anxiety disorder. **Methods.** Review of Literature on anxiety and evidence-based interventions used to reduce anxiety. Search terms included anxiety, coping with anxiety and studies published between 2012 and 2017 were selected. **Procedures.** Identification of most relevant approaches and summary of each approach and benefits of each technique/exercise. Healthy ways to manage and cope with anxiety are presented in this poster. how an individual can control their response to the negative stressor. **General Statistical Plan.** Systematic review of the literature, identification of current effective interventions, and concise summary of each technique/exercise. Several studies examined how an individual can control their response to a negative stressor and improves positive emotions and mood. **Results.** The findings indicate several studies reported success with holistic interventions such as yoga-enhanced cognitive behavioral therapy for anxiety management; effects of exercise on anxiety levels and metabolic functions; lavender oil for anxiety; and foods that have been shown to reduce anxiety. These interventions lead to a reduction of an individual's anxiety and improved coping skills and understanding of

trigger(s). **Conclusion.** Overall, the review of literature on reduction of anxiety and management of anxiety identified various approaches that were presented in this poster. One can take control over their perception of an anxiety provoking stimuli thus, not allowing their anxiety to control them. “No amount of regret can change the past. No amount of anxiety can change the future.” -Karen Salmansahn

Presenting in Kendall

12:15-1:15 p.m.

Exploring the Perceptions of Patients and Family Members on What Makes an Extraordinary Nurse: A Qualitative Analysis

Victoria Y. McCue, MSN, Ph.D. Nursing Student, College of Nursing, Baptist Health South Florida

Objective. The objective of this study was to explore the experiences and perceptions of patients’ and families’ DAISY Award® submissions to determine what makes an extraordinary nurse. **Background.** Nursing’s fundamental tenets have not changed over time. These tenets identify that nursing is founded on specific human values, scientific knowledge, and technical skill. Understanding patients’ and families’ perspective on what makes an extraordinary nurse is an important aspect in redefining the relationship that nurses have with their patients and families. Patient- and family-centered care is an approach to the planning, delivery, and evaluating health care that is grounded in mutually beneficial partnerships among health care providers, patients, and families. **Methods.** DAISY Award® nominations between May 2012 and June 2013 that were submitted by a patient or family member were included in the qualitative content analysis. A total of 53 DAISY Award® nominations were reviewed. **Results.** Six narrative themes emerged: (1) Part of the Family/Feel at Home; (2) Extreme Caring; (3) Family Focus; (4) Connecting from the heart; (5) Skilled Education/Knowledgeable; and (6) Human touch. **Conclusion.** The results of this study have helped develop an understanding of the essence of what makes an extraordinary nurse in the eyes of our patients and families. By understanding what makes an extraordinary nurse in the perceptions of patients and families, nurse leaders can create nurse development and evaluations rooted in a patient and family-centered approach.

Atrium – Poster 48

12:15-1:15 p.m.

Gait Pathomechanics as Differentiators of Performance in Collegiate Distance Runners

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Objective. This study was conducted to determine if lower extremity running gait pathomechanics could differentiate between high and low performing collegiate distance runners. **Background.** Faulty running biomechanics such as excessive hip adduction (HADD), hip internal rotation (HIR), counter pelvis drop (CPD), and rearfoot eversion (REV) have been associated with musculoskeletal injury. Their role in performance is poorly understood. **Methods.** Two top-performers (TP) and two bottom-performers (BP) from both men’s and women’s university cross-country teams were studied, [males (TP; 20.5±0.7 yrs, 64.6±3.5 kg, 1.77±0.1 m) (BP; 18.5±0.7 yrs, 57.5±.6 kg, 1.82±0.0 m)], [females (TP; 18.0±0.0 yrs, 59.45±4.6 kg, 1.67±0.0 m) (BP; 18.0±0.0 yrs, 57.8±4.1 kg, 1.68±0.1 m)]. They were identified by reviewing five NCAA races (5k – 10k) for consistent performance (Fall season 2017). Participants underwent a 3D analysis using a 10-camera motion capture system while running on an instrumented treadmill (2.4-4.0 m/s) during their pre-participation examination. Right leg peak excursion of HADD, HIR, CPD and REV were calculated using Nexus software (ver. 2.7) and compared between TP and BP. **Results.** BP males had greater peak HADD (10.9±2.5 vs. 6.2±5.2°), HIR (23.6±1.8 vs. 10.7±11.0°), CPD (5.7±1.3 vs. 4.8±0.8°), and REV (13.7±0.0 vs. 7.9±0.0°) than TP. BP females had greater HIR than TP, 22.1±4.9 vs 13.5±1.1°, respectively. **Conclusion.** Running pathomechanics, as defined as excessive hip, pelvis, and rearfoot motion may differentiate between running performance, particularly in males. Coaches may use these results to promote proper running mechanics to not only reduce injury risk but to improve performance. **Grants.** This study was not funded.

Assessing Skin Water of Upper and Lower Extremities via Tissue Dielectric Constant (TDC): Suitability of Single vs. Multiple Measurements

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Don Woody, College of Medical Sciences, Nova Southeastern University
Harvey N. Mayrovitz, Ph.D., Professor, College of Medical Sciences, Nova Southeastern University

Objective. To determine differences in absolute and relative TDC values based on one measurement per anatomical site versus averaging duplicate or triplicate TDC values. **Background.** TDC measurements are used to estimate skin water content changes in breast cancer and lower extremity lymphedema. Most prior studies used triplicate averages at each anatomical site because the suitability of single measurements was unknown. If the accuracy of one measurement was adequate then much clinical measurement time could be saved. **Methods.** Females (n=25) and males (n=25) participated. Average group age (mean \pm SD, N=50) was 30.6 \pm 13.4 (range, 18 to 70 years). Triplicate TDC measurements were made bilaterally at five anatomical sites representative of lymphedema development areas; anterior forearm, hand palm, lateral calf, medial calf and foot dorsum. TDC values obtained with single measurements were compared to duplicate and triplicate averages at each site (N=100). TDC dominant-to-nondominant side ratios (N =50) were also compared. **Results.** Triplicate average TDC values for forearm, hand, lateral calf, medial calf and foot were respectively, 31.1 \pm 4.4, 42.7 \pm 8.2, 40.1 \pm 6.7, 34.4 \pm 5.3 and 31.6 \pm 5.3. The average percentage difference between these triplicate values and those obtained with a single measurement was less than 0.75% at all sites with a maximum SD of 4.7% at the medial calf and a minimum of 2.2% at the forearm. Dominant-to-nondominant side TDC ratios using triplicate values were respectively 1.013 \pm 0.090, 1.019 \pm 0.112, 1.019 \pm 0.163, 1.052 \pm 0.134 and 1.029 \pm 0.108. Ratios using single values differed by at most 1.5%. **Conclusions.** Use single TDC values if a deviation from triplicate averages of \pm 5% is acceptable.

Evaluating Barriers During Pharmacy-Led Transition of Care (TOC) to Patients in the Nova Southeastern University (NSU) Adherence Outreach, Transitions of Care and Medication Therapy Management (ATM) Center

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Moiz Siddiqui, College of Pharmacy, Nova Southeastern University
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Objective. To evaluate barriers in pharmacist-led TOC. **Background.** Prior studies have shown barriers that impede pharmacists' role in TOC; however this data is limited in the outpatient setting. This is especially evident when it comes to pharmacist-physician interaction and patient acceptance. A previous study demonstrated that overcoming these obstacles can decrease readmissions and medication errors, while improving the patient's understanding of their medications. **Methods.** A retrospective observational study will be completed to evaluate TOC calls performed by pharmacy interns at the ATM Center using REDCap. The ATM center is notified by the physician of a patient discharge. The pharmacy intern calls the patient to perform a medication reconciliation, provide active patient counseling, a clinical medication review and confirm a scheduled follow up appointment with their primary care doctor. The call is documented within REDCap and if an intervention is made, the recommendation is documented in the patient's electronic medical record and assigned to the physician. **Results.** Pending data collection and conclusion.

Student Experience with a Co-Curricular Program Design to Enhance Personal and Professional Growth

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Objectives. To assess student satisfaction of a structured co-curricular program designed to increase guidance in selecting experiences that foster personal and professional development. **Background.** Accreditation standards require the establishment of a co-curricular program to expose students to various types of Pharmacy practice. **Method.** Students were required to complete a minimum of 7 co-curricular activities divided between 5 specific areas of professional growth. P1 students completed an anonymous 17-item on-line questionnaire at the end of the first semester. A five-point Likert scale measured: impact on personal/professional growth, value of the experiences, development of problem solving skills, ability to work as a team member, interaction with other healthcare professionals and cultural awareness. Barriers to completing co-curricular experiences were also addressed. **Results.** 199 students, 67.3% female, 31.7% male and 1% gender neutral completed the questionnaire (74% response rate). 81% of students found the experiences helped them grow as a person/professional; 73% found the co-curricular experiences to be of value; 60% reported that their ability to problem solve increased and 79% stated that their ability to work as part of a team improved. 87% indicated co-curricular experiences allowed interaction with other healthcare professionals and 75% reported improved knowledge of individuals from other races/cultures. Academic obligations were the most common barrier to completing co-curricular experiences. Overall, 73% of students would complete co-curricular activities if not required. **Implications.** A co-curricular program structured to provide experiences focusing on personal/ professional growth is valued by students and promotes growth in these areas. **Grants.** None

Atrium – Poster 52

12:15-1:15 p.m.

Modulation of Angiotensin II Binding and AT1 Receptor Expression in Experimental Alport Mouse Kidney

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Judith T Molina-David, University of Miami
Alessia Fornoni, University of Miami
Robert Charles Speth, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objective. To measure AT₁ angiotensin II (AngII) receptor (AT1R) expression in an animal model of Alport Syndrome (AS) to assess the association between these receptors and this disease. **Background.** AS is a progressive renal glomerular disease, causing kidney failure, and hearing and visual impairment, affecting up to 3% of children and 0.2% of adults with end-stage renal disease (ESRD). It is caused by mutation of a Type IV collagen gene. Angiotensin converting enzyme inhibitors (ACE-I) and angiotensin receptor blockers (ARB) are the only treatments that slow progression towards ESRD in AS. **Methods.** Kidneys from 8-week-old Col4a3^{-/-} (KO) and wild-type mice were assayed for AT1R using ¹²⁵I-sarcosine¹, isoleucine⁸ AngII saturation binding assay and receptor autoradiography to determine receptor density, distribution and binding affinity. **Results.** There was a 48% decrease (p-values did not differ between the groups. Receptor autoradiography showed no difference in AT1R density between the groups (153 versus 149 fmoles/g wet weight). However, AT1R's were more diffusely distributed in the KO kidneys. **Conclusion.** The density of AT1 receptors in the AS model kidney is reduced. This suggests that renoprotection with ACEi-ARB in AS is not linked to overexpression of renal AT1R. **Funding.** Peggy and Harold Katz Family Endowed Professorship (AF), Cardiovascular Neuroscience Fund.

Atrium – Poster 53

12:15-1:15 p.m.

A Case of Progressive Optic Neuropathy in a Patient with Wegener's Granulomatosis

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Jessica Siu, College of Optometry, Nova Southeastern University

Introduction. We describe a case of a patient with Wegener's Granulomatosis (WG) who developed progressive optic atrophy and worsening of vision despite treatment. **Case presentation.** A 46 year old Hispanic male presented with complaints of blurry vision OD>OS. He had been diagnosed with WG 3 months earlier and after experiencing multiple symptoms, was stabilized on prednisone. VA was 20/15 in each eye, C/D ratios were .20 OU with sectoral pallor OD, moderate retinal nerve fiber layer (RNFL) loss OD on OCT, and retinal vascular changes OU. Visual fields showed generalized depression OD and arcuate defect OS. At a 5-month follow up visit, he complained of

worsening vision, and VA had worsened to 20/40 OD. Discs in both eyes showed increased cupping, increased pallor, and markedly thinner RNFL. **Deviation from the Expected.** We know of no reported cases of progressive optic atrophy over the course of several months in a systemically stable WG patient. **Discussion.** WG is a rare, multisystem autoimmune disease that causes inflammation of blood vessels, leading to tissue necrosis. Most commonly affecting the respiratory tract and kidneys, without treatment prognosis is poor. Ocular involvement occurs in 50-60% of cases, potentially affecting virtually every part of the eye. Optic atrophy, secondary to optic neuritis may be caused by vasculitis, inflammation from adjacent sinuses or compression by intraorbital granuloma. **Conclusion.** WG may lead to progressive vision loss over a relatively short period of time despite the absence of systemic symptoms. Co-management with the other patient providers is essential.

Atrium – Poster 54

12:15-1:15 p.m.

How Does Health Impact Happiness? Overall, Mental and Physical Health and Happiness

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Shaan Patel, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University
Renée Tornea, Nova Southeastern University
Jonathan Wu, Nova Southeastern University

Objective. This study was conducted to determine if overall health, mental health or physical health have a significant association with happiness in Americans. **Background.** Research performed in Kuwait has shown that mental health has a significant association with happiness. This study aimed to see if there is a similar association in the United States. **Methods.** Data was collected from the General Social Survey, a bi-annual personal interview survey by the National Opinion Research Center. A univariate analysis, bivariate analysis, logistic regression and odds ratio were conducted to analyze the data. **Results.** There are statistically significant associations between overall health and happiness, mental health and happiness, and physical health and happiness. For overall health and happiness, the percentage of happiness differed by $\chi^2(9,2292)=248.76$, $p=2(9,1416)=155.98$, $p=2(9,699)=25.31$, $p=0.0026$. Logistic regression showed $\chi^2=93.48$, $p<0.0001$, therefore a significant prediction based on mental health can be made regarding happiness. The odds ratio of mental health and happiness showed OR 8.25 95%CI (3.02-21.79). Therefore, if exposed to 30 days of poor mental health, one is 8.25x more likely of being unhappy. **Conclusion.** There is a significant association between overall health, mental health, physical health and happiness. Health professionals should focus on improving patients' mental health to improve their happiness. **Grants.** Not applicable.

Atrium – Poster 55

12:15-1:15 p.m.

Professional Mixed Martial Arts GPS Tracking: An Exploratory Report

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Objective. The purpose of the investigation is to report live-sparing microsensor data for the Professional Mixed Martial Arts (MMA) athlete. **Background.** Microsensor, wearable technology is a non-invasive approach to monitoring an athlete's training stress through multiple variables such as load, acceleration, change of direction, jumps, etc. Although data has been analyzed in multiple athletic populations, minimal data exists in the MMA population. **Methods.** Professional MMA athletes ($n=3$; 27.25 ± 2.4 yrs.; 180.7 ± 4.4 cm. $77.3 \pm .34$ kg.) signed under the Ultimate Fighting Championship (UFC) were monitored using a single validated microsensor with 100Hz tri-axial accelerometer, gyroscope and magnetometer (Catapult Sports, OptimEye S5). The athletes participated in a sparring practice (1h 17min 58s) consisting of multiple disciplines including striking, wrestling, and MMA. The microsensor was secured to the middle of the upper-back located between the right and left trapezius muscles. Player Load (PL), Player Load Per Minute (PLM), Maximum Heart Rate (MHR), and Average Heart Rate (HR) were reported for the sparring session. Means and measures of variability (i.e, standard deviation) were computed

for all variables via. SPSS 20. **Results.** A descriptive analysis of the session demonstrated a mean PL of 425.51 ± 74.11 , PLM of 5.45 ± 1.0 , MHR of 207.33 ± 15.32 , HR of 138.80 ± 5.41 . **Conclusion.** The exploratory data and use of validated microsensors may contribute to the quantifying of variables such as PL and PLM during a MMA sparring session. **Grants.** N/A

Atrium – Poster 56

12:15-1:15 p.m.

The Significance of the Renin Angiotensin System in the Screening, Diagnosis, and Treatment of Colorectal Cancer (CRC)

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Julia Ladna, OMS-III, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University
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Objective. The purpose of this study is to evaluate the possible use of angiotensin receptor biomarkers and angiotensin receptor blocker medications (ARBs) in the diagnosis and treatment of certain colorectal cancers (CRC). **Background.** Colorectal cancer (CRC) remains the third most common cause of cancer death in the United States. Multiple studies have demonstrated the overexpression of the A-II type 1 receptor (ATR1), which has been overexpressed in several human cancers. **Methods.** Methods as described in Goldstein et al.4. **Results.** In this analysis, we observed statistically significant alterations in many RAS related components gene expression in colorectal cancer specimens. AT1 receptor gene expression was unchanged. There was a highly significant reduction in Mas1 gene expression. There was a substantial increase in neprilysin gene expression in colorectal tumor tissue. Of note, Neprilysin is inhibited by sacubitril a component of the heart failure drug, Entresto® (sacubitril/ valsartan). It will be of interest to determine if patients on Entresto® have a reduction in colorectal cancer incidence. **Conclusion.** This analysis is consistent with involvement of the RAS in colorectal cancer. However, the pathological significance of the changes in RAS related gene expression will require continued assessment of the effects of drugs that inhibit or enhance the activities of these various RAS related components on the incidence and the survivability of colorectal cancer.

Atrium – Poster 57

12:15-1:15 p.m.

The Effect of Osteopathic Manipulative Therapy on a Patient Presenting with Thoracic Outlet Syndrome and Concomitant Cervical Scoliosis

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Introduction. This case study was performed to ascertain the effects of OMT on a patient with TOS and Cervical Scoliosis. Existing literature shows that TOS secondary to compression of the brachial plexus or the subclavian artery/vein can be managed with intense myofascial release, stretching and OMT with the most efficacious intervention currently being decompressive surgery. To date, no evidence has been compiled relating the effects of OMT on a patient with TOS along with Cervical Scoliosis. **Case Presentation.** One female patient (Caucasian, Age 39) with complaints of Cervicalgia secondary to cervical scoliosis and right upper extremity numbness, weakness and tingling secondary to TOS was evaluated for increases in strength and ROM and decreases in pain scale of the cervical spine and right upper extremity due to the effects of OMT along with a moist heat modality. **Deviation from the Expected.** This case is unique in the fact that this patient presents with TOS along with a concomitant scoliosis of the cervical spine. Also, all techniques were performed using a moist heat modality. **Discussion.** Since this patient is healthy and active more direct techniques were employed. Modalities utilized were Muscle Energy, Direct Myofascial Release and Soft Tissue. Areas of focus were the scalenes, trapezius, pec minor and the clavicle (AC and SC joints). **Conclusion.** The findings of this case report could help create a treatment plan utilizing OMT and a moist heat modality for a Sports Medicine or Neuromuscular Medicine patient that presents similarly.

Decreasing Injury in Children Ages 0-12 Years Old Through the Use of Proper Vehicle Restraint Systems

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Child passenger safety devices were first introduced into the automobile world during the 1970s. Since that time, safety for the child passenger has come a long way. Each year about 2,000 children die in motor vehicle accidents (Lee, Farrell, & Mannix, 2015). To combat those statistics, the Office of Disease Prevention and Health Promotion's Healthy People 2020 (2017) came up with a goal to decrease the number of pediatric injuries and fatalities related to vehicular crashes by increasing use of age-appropriate vehicle restraint systems by the year 2020. The proper utilization of child passenger safety devices helps to decrease the number of childhood fatalities related to automobile accidents (Bae, Anderson, Silver, & Macinko, 2013). To help parents to understand how to properly use their safety seats, the American Academy of Pediatrics, Committee of Injury, Violence, and Poison Prevention (2011) developed a set of guidelines for what type of safety seat the child should be using depending on age, height, and weight. Oftentimes, there is a lack of knowledge for parents when it comes to proper use of a car seat, leading to an increased risk for injury for the child (Horder, 2016). As nurses, we must educate parents on the importance of proper utilization of child passenger safety devices during opportunities such as prenatal visits, prior to discharge from the hospital after delivery of a child, and also during pediatric wellness visits. Providing this education will contribute to a decrease in the amount of injuries of children involved in vehicle accidents, therefore decreasing the number of pediatric patients being treated for motor vehicle accident-related injuries (Horder, 2016).

Unique Pathogenesis of Burkitt's Lymphoma with Presentation in the Nasopharynx

Gabriel Quinones-Medina, MS, MBS student, College of Medical Sciences, Nova Southeastern University

Introduction. Epstein-Barr Virus (EBV) is a known causative agent for B-cell hyperplasia, and has a significant role in the pathogenesis of the aggressive B cell-derived Burkitt's Lymphoma (BL). Typical locations for primary BL tumors include the face, kidneys, reproductive organs, gastrointestinal organs, and meninges. However, BL development is complex and does not always occur in predictable patterns. **Case Presentation.** The present case describes a 72-year-old Caucasian female who presented with a sore throat, cough, left ear pain and hearing loss. Initial examination revealed serous fluid in the left middle ear, and nasopharyngoscopy showed prominent tissue present in the nasopharynx with overlying thickened mucus and dried blood. CT scan was completed and forwarded to radiology for review. A biopsy was obtained, and samples were analyzed with histology and flow cytometry. Tissue findings were consistent with BL and were negative for EBV. **Deviation From the Expected.** The present case describes an atypical pathogenesis and presentation of BL, which is not well documented in the scientific literature. **Discussion.** EBV is present in 95% of BL cases. Furthermore, lymphomas of adulthood (mean age of onset of 30-50 years) account for only one percent of all BL cases, whereas childhood lymphomas (mean age of onset 5-10 years) account for 30% of cases. Our patient outlies both of these normative BL conditions. Equally important to note is the location of our patient's tumor; the nasopharyngeal space is not a common site for BL and, in fact, nasopharyngeal BL accounts for less than 23% of all Non-Hodgkin lymphoma cases. **Conclusion.** Although one similar EBV-negative case has been described, to our knowledge this is the first reported case of an older Caucasian female with EBV-negative nasopharyngeal BL.

Motivation and the Use of Discussion Boards in Online Science Learning

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College students will participate in any learning activity when they feel it helps. Students have an uncanny sense of a tipping point of use. Is it worth my time? Will it help me get a better grade? Discussion boards only work if they help and not hinder online learning. Discussing course content online can be as useful as discussing it among physical classmates. In fact, actively using discussion boards can encourage students to be active users not passive watchers. Users are motivated to engage. Watchers disengage. The present paper provides six examples of how DB motivated online learning. These examples are not exhaustive, but include DB as a way to organize teams, use other tools, file share, mentor, share experiences, and create a small learning community within a larger class. The advantages and disadvantages of using discussion boards are then presented along with some conclusions about motivation theory. The main purposes of this paper are to: 1) provide examples of the use of DB that illustrate the impact of emotion and motivation on successful online learning and 2) connect these examples to current theory. Active users learn, passive watchers don't. Discussion boards can be a very effective learning tool, but only if the professor wields the power of motivation.

A Rare Finding of Radial Nerve Transection Associated with a Closed Humeral Shaft Fracture

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Timothy Niedzielak, D.O., Broward Health Medical Center, Orthopaedic Surgery Residency Program
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Bradley Roth, D.O., Broward Health Medical Center, Orthopaedic Surgery Residency Program

Introduction. A common complication seen with humeral shaft fractures is radial nerve palsy. A lack of consensus remains regarding the management of radial nerve dysfunction secondary to humeral shaft fractures, specifically with closed fractures. An increasing number of reports suggest that nonsurgical treatment leads to recovery of nerve function in nearly all patients. **Case Presentation.** 25-year-old female who was involved in a pedestrian vs motor vehicle accident. A passing vehicle swiped her right side, causing multiple injuries to her right upper extremity. She was brought to Broward Medical Center as a level 1 adult trauma. Examination revealed obvious deformities of the right upper extremity. On neurological exam the posterior interosseous nerve motor function was absent and her sensation to light touch over the radial nerve distribution was decreased. Radiographs revealed a right closed segmental midshaft humerus fracture. Exploration revealed that the radial nerve was found to be transected and within the fracture site. Open reduction and internal fixation of the midshaft humerus was achieved. Plastic surgery was urgently consulted for neuroorrhaphy of the radial nerve. The patient tolerated the procedure well and is being followed postoperatively. **Discussion.** This case is unique in that the radial nerve was transected in relation to a closed humeral shaft fracture. Transections found after closed humeral shaft fractures are extremely rare. Most radial nerve transections are commonly reported in the presence of an open humeral shaft fracture. With primary exploration, we prevented unnecessary delay that may have otherwise blunted the healing ability of the radial nerve. This case highlights the importance of clinical judgment.

The Reliability of the Upper Limb Tension Test: A Comparison of an Experienced Clinician and a Doctor of Physical Therapy Student

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Ovidio Olivencia, Dr. Pallavi Patel College of Health Care Sciences, Nova Southeastern University

Amanda Feldstein, Nova Southeastern University
Cameron Lombardi, Nova Southeastern University
Andrew Miller, Nova Southeastern University
Mongseyla Touch, Nova Southeastern University

Objective. Determine the interrater reliability between an experienced clinician and a Doctor of Physical Therapy Student (SDPT) when performing the Upper Limb Tension Test with median nerve bias (ULTT1). **Background.** The ULTT1 is a common orthopedic test performed in physical therapy clinics designed to assess the mobility of the median nerve, accompanying branches, and associated nerve roots (C5,C6,C7). The ULTT1 has been shown to be an effective diagnostic test for conditions such as cervical radiculopathy, and a positive test may have prescriptive value. The reliability of the ULTT1 has been demonstrated, however, there is a paucity of evidence regarding the ability of a student to perform these tests in a comparable manner to that of an experienced clinician. **Methods.** Twenty healthy participants (mean age 25-years) were recruited via convenience sampling. Following consent, a second-year SDPT investigator and a clinician with 18 years of clinical experience performed the ULTT1 on each subject. A separate examiner recorded elbow extension range of motion (ROM) at the terminal point of the test, which was used for the analysis. **Results.** The intraclass correlation coefficient was .78 suggesting good interrater reliability. The MDC₉₅ was 12°. **Conclusion.** The ULTT1 used in this study possessed good reliability when comparing to a SDPT to an experienced clinician, thus extensive clinical experience may not be necessary to accurately perform the test. The MDC₉₅ indicates that changes of 12° or greater are needed to exceed the threshold of error.

Atrium – Poster 63

12:15-1:15 p.m.

Decreased Vision as Presenting Sign of Progression of Meningioma

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Introduction. Brain tumors can present with different symptomatology depending on the location and size of the lesion. Meningiomas account for about 34% of all primary brain tumors, they tend to grow slowly, and may be large in size by the time symptoms present. Symptoms may include headaches, diplopia, visual disturbances, nausea and tinnitus or hearing loss. **Case Presentation.** A 39 y/o female presented for a contact lens exam with complaints of decreased vision in the left eye for the past 3-6 months. Medical history was significant for a benign cavernous sinus meningioma on the left side diagnosed 3 years prior. No defect was noted on ocular motility or confrontation fields. However, a left afferent pupillary defect was noted and she was unable to appreciate the HRR color plates in the left eye. Best corrected DVA was 20/20 right eye, 20/25 left eye. Pallor of the optic nerve neuro-retinal rim was noted in the left eye only. Humphrey visual field testing revealed an incomplete left hemianopsia. **Deviation from the expected.** A mild visual complaint in a patient with a known meningioma prompted the patient to present for an eye examination prior to neurological consult. **Discussion.** Patients with meningiomas require routine ophthalmological and neurological evaluation including imaging studies. The patient was referred to her neurosurgeon and a neuro-ophthalmologist. MRI testing confirmed that the tumor increased in size and affected the prequiasmatic, intracanalicular, and distal intraorbital segment of the left optic nerve. **Conclusion.** An interdisciplinary approach is recommended for all patients with brain tumors and especially with meningiomas due to the likely presentation of ocular symptoms. Recommendations for ophthalmological baseline and follow up testing will be discussed. **Grants.** N/A

Atrium – Poster 64

12:15-1:15 p.m.

Regulation of Cellular Cobalamin Acquisition and Processing by Nrf2 and mTORC1 Downstream of Neurotrophic Factors

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Objective. Define the roles of Nrf2 and mTORC1 in regulating cobalamin content downstream of neurotrophic factors in SH-SY5Y neuroblastoma cells. **Background.** Vitamin B12 (cobalamin) serves as a cofactor for methionine synthase, which catalyzes the regeneration of methionine from homocysteine. Cellular cobalamin processing requires proper lysosomal acidification and the availability of cytoplasmic glutathione. Mechanistic target of rapamycin complex 1 (mTORC1) abrogates lysosomal acidification and Nuclear factor (erythroid-derived 2)-like 2 (Nrf2) promotes glutathione production. Both mTORC1 and Nrf2 are activated downstream of neurotrophic factor-induced receptor tyrosine kinase signaling. We seek to understand the individual roles of Nrf2 and mTORC1 in regulating cobalamin content in this setting. **Methods.** SH-SY5Y cells were pre-treated with temsirolimus (TEMS) or treated with either neuregulin-1 (NRG-1) or brain-derived neurotrophic factor (BDNF). RT-qPCR was performed to measure gene expression. Cobalamin analysis was done via HPLC. **Results.** Both 1 nM and 100 nM NRG-1 decreases LMBRD1 (probable lysosomal cobalamin transporter) expression, but only 1 nM NRG-1 decreased ATP6V1H (V-type proton ATPase subunit H) mRNA. 10 nM BDNF decreased both LMBRD1 and ATP6V1H mRNA levels. 10 nM BDNF may selectively increase adenosylcobalamin. Furthermore, pre-treatment of cells with 100 nM TEMS and treatment with 100 nM NRG-1 increased cobalamin content over either agent alone. **Conclusion.** Our research suggests that different neurotrophic factors play unique roles in regulating cobalamin processing, NRG-1 may have opposing effects at various concentrations, and that mTORC1 activation can limit cobalamin content in SH-SY5Y cells. **Grants.** This research was partially funded by the A2 Milk Company.

The Impact of Pre-Combination Antiretroviral Therapy Versus Combination Antiretroviral Therapy Era on HIV-Associated Neurocognitive Disorders: A Systematic Review

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Barry Bleidt, PharmD, Ph.D., Professor, College of Pharmacy, Nova Southeastern University

Objectives. The objective of this presentation is a systematic literature review to consider HIV-associated neurocognitive disorder (HAND) rates before and during the cART era. **Background.** This paper is a combination of literature reviews, observational studies, prospective studies and retrospective studies. A second objective of this systematic review is to identify and summarize recent studies that examine asymptomatic neurocognitive impairment in HAND during the pre-combination Antiretroviral Therapy (pre-cART) and combination Antiretroviral Therapy (cART) era. **Methods.** A systematic literature review was conducted to include English-language articles published from 2006 to 2016 on January 19th, 2017. A total of four electronic databases were used including MEDLINE, PUBMED, EMBASE, and PsycINFO and were searched to identify potentially relevant articles. Conference abstracts and dissertation defenses were not included in this review. The search combined free text and medical subject headings (MeSH) disease terms with HIV-associated neurocognitive AND combination antiretroviral therapy with asymptomatic neurocognitive impairment OR mild cognitive disorder OR HIV-associated dementia. **Results.** Despite enhanced research efforts and effective cART, there still is a high prevalence of HAND within the HIV-infected population. Although the most severe form of HAND, HIV-associated dementia (HAD) is much less common in cART era, researchers still pose questions about any long-term benefit of cART with respect to milder forms of HAND. Preliminary findings have shown that patients with ANI will progress more quickly to more severe forms of HAND than those without ANI. Given this, the relevance of the correct diagnosis of ANI is crucial where well over 50% of all HIV-infected patients suffer from some stage of HAND mentioned above. **Conclusions.** There are various social, economic, and public health implications surrounding HIV & neurocognitive disorders. The burden of disease for this population is increasing at an exponential rate but are still unaware of the long-term survival with chronic immune activation. Future studies should assess the will this impact the aging population, the role of medication adherence, the impact of comorbidities affect HIV-associated neurocognitive disorders and the role of poly-pharmacy. Overall there is a continued need for biomarkers of HAND predisposition, detection, and monitoring.

Discrepancies Between Self-Reported Exercise and Actual Physical Fitness Levels: A Review of Low, Moderate and Vigorous Exercise

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No clear patterns have been determined in the relationship between self-reported physical activity and actual values; however, there have been occasional trends seen based on the amount of physical activity employed, the level at which one trains, and gender. **Objectives.** The purpose of this study was to compare the differences between men and women in self-reported responses on the International Physical Activity Questionnaire (I-PAQ) and their actual physical fitness levels. **Methods.** The Forty-two men and 91 women filled out the International Physical Activity Questionnaire (IPAQ) and participated in the following fitness assessments: body composition (three-site skinfold), handgrip strength, pushups, plank, VO₂ (Rockport fitness submax), and sit & reach. **Results.** Self-reported physical activity levels were correlated with all physical fitness assessments in females except handgrip. Not a single physical fitness measurement was correlated with self-reported exercise in males, indicating either a deliberate or subconscious discrepancy between self-reported exercise levels and actual exercise levels.

National Level Analysis of Opioids-Related Death and Hospital Adverse Drug Events, 2009-2014

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Objective. This study was conducted to determine the national rates of prescription opioids health outcomes including overdose death and opioids-related adverse drug events (ADEs) during hospitalization. **Background.** Opioid use is associated with major consequences, that affect patients in both inpatient and outpatient settings, including overdose, oversedation, respiratory depression and death. In 2015, prescription opioids overdose death was responsible for over 40% of the total drug overdose deaths in the United States. Among hospitalized patients, opioids were used in 51% of the patients and the risk of death was more than 3 times higher in patients who encountered opioids-related ADEs. **Methods.** This study was an exploratory retrospective analysis of two prescription opioids health outcomes from 2009 to 2014. The National Vital Statistics Mortality files (NVSM) were used to obtain data on the national rate of prescription opioid overdose deaths using ICD-10[FS1] codes. The National Inpatient Sample (NIS) data were used to explore the national rate of opioids-related hospital ADEs using ICD-9 codes to extract the data and identify the study population. **Results.** The average national rate was approximately 17,360 deaths/year for opioids overdose death and over 31,545 events/year for opioids-related hospital ADEs. Thirteen percent of these ADEs were present on admission, and 2 percent were associated with death during hospitalization. **Conclusion.** Prescription opioids health related outcomes including overdose deaths and adverse drug events were common in both inpatient and outpatient settings. **Grants.** This study was partially funded by a grant from the Health Professions Division (HPD) at Nova Southeastern University.

High and Low Impact Physical Activity Positively Influences Female Bone Density

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Objective. The aim of the current study was to add to the current literature the effects of high and low impact physical activity on female bone health. **Background.** Exploring lower cost preventative measures to improve bone density may reduce the physical and financial repercussions associated with health risks such as osteoporosis. **Methods.** Fifty-four female athletes total bone mineral density was tested using a dual-energy x-ray absorptiometry (DEXA) machine. Athletes were defined as either high intensity (HI) or low intensity (LI) based on training mode. **Results.** There was not a significant difference between groups in bone mineral density for HI females ($M=1.25$, $SD=0.10$) and LI females ($M=1.22$, $SD=0.11$); $t(51) = -1.057$, $p=.295$. **Conclusion.** Females that regularly take part in either high or low intensity activities may benefit from having improved bone mineral density.

Reference Values for Assessing Localized Hand Edema or Lymphedema Using Skin Tissue Dielectric Constant (TDC) Inter-Hand Ratios

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Harvey N. Mayrovitz, Ph.D., Professor, College of Medical Sciences, Nova Southeastern University

Objective. To determine inter-hand TDC ratio thresholds in healthy persons as a first step in developing reference values for detecting edema or lymphedema that manifest at hand sites. **Background.** TDC measurements, which are strongly dependent on tissue water, have been used for early detection of breast cancer treatment-related lymphedema and for tracking changes associated with treatment. The best indicator is the ratio of the at-risk limb to the non-affected limb. Forearm data exists in the literature but there are no reference values of hands. **Methods.** A total of 70 healthy women (35 YOUNG and 35 MATURE) were evaluated after signing an IRB approved consent. TDC was measured on the hand dorsum bilaterally with a device that contacts the skin for about 7 seconds and measures to a depth of 2-3 mm. **Results.** Compared to the YOUNG group, TDC values of the hand dorsum of the MATURE group were statistically significantly less ($p < 0.008-0.002$). However, the dominant to non-dominant TDC ratio was similar for YOUNG and MATURE (1.017 ± 0.109 VS. 1.035 ± 0.090 , $p = 0.452$). The distribution of all TDC ratios were demonstrated a Gaussian distribution and a plausible conservative reference threshold TDC ratio for the distribution was determined by the mean value, 1.026, plus 2.0 SD which equals 1.226 and rounded to 1.23. **Conclusion.** An age-independent inter-hand TDC threshold ratio of 1.23 can be potentially useful for hand edema or lymphedema detection and is a good initial starting threshold to apply as a clinical indicator.

Potential Utility of Sacral Skin Temperature to Detect Patients at High Risk for Pressure Injury

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Objective. To test the hypothesis that skin temperature differentials, between sacral versus remote skin, can detect patients with increased-risk for pressure injury due to vascular disease. **Background.** Hospital-acquired pressure injuries (HAPI) affect about 2.5 million patients in acute-care hospitals annually. Patients with vascular disease are at greater risk of HAPI but no method can detect which patients with vascular disease are more likely to develop HAPI. **Methods.** In 100 ICU patients, a commercial thermal imaging system was used to obtain simultaneous photographic and infrared thermal images (11 × 14 inches) of the patient's buttocks and a remote skin area. Images were processed to determine temperature differences $DT = \text{sacral (at-risk)} - \text{remote (non-at-risk)}$ using a discrimination threshold DT of -1.5°C . The vascular status of patients exceeding this threshold were compared with the remainder. **Results.** Thirty-two patients exceeded the threshold with an average ΔT of $-1.92^{\circ}\text{C} \pm 0.62^{\circ}\text{C}$. In 6 patients, ΔT was greater than $+1.5^{\circ}\text{C}$, with average of $+1.98^{\circ}\text{C} \pm 0.49^{\circ}\text{C}$. The remaining 63 patients had an average ΔT of $0.13^{\circ}\text{C} \pm 0.58^{\circ}\text{C}$. Chi-square analysis of the proportions of patients exceeding or not exceeding thresholds in relation to their known vascular disease status revealed no significant difference between these subgroups. **Conclusion.** Although infrared thermal screening may provide visually impressive and potentially useful images in some cases, the use of temperature differentials to detect patients at particularly high risk for pressure injury owing to local blood flow is not supported by results of this study.

Atrium – Poster 71

12:15-1:15 p.m.

OCT-Angiography of Idiopathic Foveal Hypoplasia and Its Correlation to VA

Kelsey Starman, BS, OD-4, College of Optometry, Nova Southeastern University

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Julie Rodman, O.D., Associate Professor, College of Optometry, Nova Southeastern University

Background. Foveal hypoplasia is characterized by the lack of a defined foveal depression with preservation of all neurosensory retinal layers. Due to the underdevelopment of the fovea, foveal hypoplasia is generally associated with varying degrees of visual acuity reduction. Recent studies have shown that visual acuity and functioning can be linked to retinal capillary density as seen on optical coherence tomography angiography. **Case Presentation.** Caucasian 25-year-old female with Duane's and accommodative insufficiency. BCVA 20/20 OD, OS, OU. Normal color vision and stereo detected on Lang and Stereo Fly, but none present on Randot. Anterior segment and posterior pole are WNL on biomicroscopy. **Clinical Testing.** Fundoscopy is unremarkable. OCT shows absence of a foveal pit OU. There was an absence of the Foveal Avascular Zone (FAZ) in the superficial and deep retinal capillary plexi on OCT-Angiography. **Plan/Treatment.** Monitor. Further ERG and VEP testing. **Discussion.** In foveal hypoplasia the superficial retinal capillary plexus is present, while the absence of the deep capillary plexus can vary. A recent study determined that the absence or diminution in diameter of the foveal avascular zone particularly of the deep plexus correlates with visual potential associated with foveal hypoplasia. Individuals with unimpaired visual acuity were found to have preservation of the deep retinal capillary plexus foveal avascular zone. **Conclusion.** Lack of a FAZ in both the superficial and deep retinal capillary plexus in a patient with idiopathic hypoplasia with preserved visual acuity was demonstrated using OCT-A.

Atrium – Poster 72

12:15-1:15 p.m.

A Case of Anoxic Brain Injury: The Importance of Preventing, Diagnosing and Treating Obstructive Sleep Apnea

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Veronica Lopez, OMS-III, Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University

Gabriela Perez, Palmetto General Hospital

Introduction. Obstructive sleep apnea (OSA) is the absence or intermittent cessation of airflow due to physical obstruction of the airway. This case study reveals the risk factors and adverse medical outcomes of OSA and advocates for the screening of OSA to decrease patient morbidity and mortality and lower national healthcare expenditure. **Case Presentation.** A 61-year-old male, with a past medical history of hypertension, was brought to the Emergency Department after suffering cardiac arrest. Laboratory studies showed diffuse hypoxic brain injury and chronic hypoxic state due to OSA. **Deviation From the Expected.** Emphasis is placed on obesity-related diseases such as diabetes mellitus and coronary artery disease. However, obstructive sleep apnea is equally

important, but remains poorly acknowledged. **Discussion.** OSA may exacerbate coronary artery disease and poor quality of life. OSA is diagnosed by polysomnography and treatments include weight loss and continuous positive airway pressure (CPAP) devices. Screening guidelines and preventive treatment will be beneficial on the patient-level and on the national-level to reduce economic expense of OSA. **Conclusion.** The current obesity epidemic poses concerns for healthcare providers in terms of controlling common chronic illnesses such as hypertension and depression, all of which can result from or be exacerbated by untreated OSA. By advancing research through commencing a clinical study analyzing the use of inpatient CPAP device on patients with OSA, this may provide better understanding of how OSA impacts other physiologies and pathologies and divulge stronger comprehension to the mechanisms of OSA co-morbidities that we encounter every day.

Atrium – Poster 73

12:15-1:15 p.m.

Loss of CDKN1C in a Recurrent Atypical Teratoid/Rhabdoid Tumor

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Carl Koschmann, M.D., University of Michigan - Ann Arbor

Introduction. We present the case of a child with recurrent atypical teratoid/rhabdoid tumor (AT/RT) who underwent clinically integrated molecular sequencing that revealed a novel loss-of-function mutation in CDKN1C alongside hallmark loss of SMARCB1. **Case Presentation.** A 6-week-old African-American female presented with respiratory distress, irritability, lethargy, and bulging fontanelle. MRI revealed a right posterior fossa mass with obstructive hydrocephalus. 8 months after gross tumor resection she returned with a recurrent right frontal lobe lesion and underwent palliative subtotal resection. **Deviation From the Expected.** In addition to biallelic loss of SMARCB1, a mutation in CDKN1C was reported and confirmed by immunohistochemistry and whole-exome and transcriptome sequencing in AT/RT. **Discussion.** Alisertib, an Aurora Kinase A (AURKA) inhibitor, was chosen for our patient due to previously published efficacy of the single-agent therapy in patients with recurrent AT/RT. **Conclusion.** Sequencing of the recurrent AT/RT revealed a novel mutation in CDKN1C could provide AT/RT new pathways for growth in addition to loss of AURKA regulation. Literature review strengthens evidence of a central upstream regulator, LIN28B, for both CDKN1C and AURKA. Further clarification of this oncogenic pathway in AT/RT should enable the development of improved targeted therapies in this patient population and provide perspective for future cancer research and therapies. **Grants.** The University of Michigan PEDS-MIONCOSEQ study was supported by grant 1UM1HG006508 from the National Institutes of Health Clinical Sequencing Exploratory Research Award (PI: Arul Chinnaiyan, Co-I: Rajen Mody). Carl Koschmann is supported by NIH/NINDS grant K08-NS099427-01.

Atrium – Poster 74

12:15-1:15 p.m.

Effects of BluTech Lenses on Melatonin, Sleep, Mood, and Neurobehavioral Performance

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Jaime Tartar, PhD, Associate Professor, College of Psychology, Nova Southeastern University
Morgan Garman, College of Optometry, Nova Southeastern University
Reaghan May, Nova Southeastern University

Objective. We examined the effects of modifying short-wavelength blue light exposure on evening melatonin levels, sleep, mood and cognition. **Background.** Intrinsically photosensitive retinal ganglion cells respond to short-wavelength light and contribute to circadian rhythm entrainment. Evening light exposure can cause melatonin dysregulation, which is associated with impaired mood and performance. **Methods.** A randomized controlled trial with crossover-design evaluated BluTech Lenses (blue light filter) versus clear lenses with anti-reflective coating only (control). Twenty-four students wore these lenses after 6:00pm for five days (Mon.-Fri.). Actigraphy watches non-invasively recorded sleep patterns each night. On the fifth evening, saliva samples were collected to quantify melatonin levels, and self-reported mood and neurobehavioral performance were assessed with the NIH Toolbox Emotion and Cognition batteries, respectively. **Results.** A significant increase in melatonin levels was measured with BluTech Lenses compared to control (9.6 vs. 4.9; $p=0.036$). Sleep onset latency was slightly reduced with Blutech Lenses, but not significantly different between glasses ($p=0.20$). Pattern comparison was significantly

improved after wearing BluTech Lenses ($p=0.04$), while other aspects of cognition were not significantly affected ($p>0.05$). A reduction in number of sleep awakenings was significantly associated with improved pattern comparison test scores ($p=0.047$). Changes in measures of mood were not significantly related to use of BluTech Lenses. **Conclusions.** BluTech Lenses appear to help regulate melatonin and can potentially be applied to at risk in order to lessen the deleterious effects of nighttime light exposure. **Grants.** Funding was provided by a grant from the US Department of Education: Science Peer & Research Collaboration.

Mobile Dating Applications and Sexually Transmitted Infections in the U.S.

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Objective. The objectives of this study are: 1) Elucidate the relationship between the introduction of mobile dating applications and the trends of syphilis, gonorrhea, and chlamydia diagnoses rates in the US; 2) To inform health professionals on STI trends, with the goal of development of interventions aimed at improving sexual health education and practices. **Background.** In the United States, from 2006-2016, there has been an overall increase in syphilis, gonorrhea, and chlamydia cases. In 2013, the mobile dating application, Tinder, was developed and is now the most frequently used mobile dating application in the United States. **Methods.** The CDC's STD Data & Statistics dataset from 2006-2016 was used for this study. Daily usage of mobile dating applications and gender of users datasets were analyzed from 2015-2017. **Results.** In the US, the CDC reports that from 2006-2016 there was an increase in incidence of 153, 36.1 and 15.1 cases per 100,00 people of chlamydia, gonorrhea, and syphilis, respectively. The most notable increase of gonorrhea and syphilis was seen from 2013 to 2016 which corresponds with the time mobile dating applications gained traction in the US. Gonorrhea incidence decreased from 2006-2013 and increased by 40.5 cases per 100,000 people from 2013-2016. Syphilis incidence increased by 5.6 cases per 100,000 people from 2006-2013 and by 9.5 cases per 100,000 people from 2013-2016. **Conclusion.** We conclude that the correlation between mobile dating application usage and risky sexual behaviors and the subsequent increase in incidence of syphilis, gonorrhea and chlamydia requires further research and analysis.

Filling in the Defect: Overnight PROSE Treatment of Persistent Epithelial Defects

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Introduction. Neurotrophic Keratopathy can result in persistent epithelial defects from poor corneal healing secondary to corneal desensitization and decreased lacrimation. This case report highlights the benefits of day and night PROSE wear in treating persistent epithelial defects resistant to conventional therapies. **Case Presentation.** A 78 year old female presented with a neurotrophic persistent epithelial defect in her left eye associated with Herpes Zoster Ophthalmicus that started 1 year ago. She had previously tried copious lubrication, autologous serum tears, bandage SCLs, amniotic membranes, and multiple temporary tarsorrhaphy without success. **Deviation from Expected.** This case is unique because the patient had a persistent epithelial defect that lasted for over 1 year despite numerous therapies. Additionally, PROSE and Scleral wear are normally limited to daytime wear due to the high risk of infection and corneal hypoxia. This presentation shows that there are benefits to overnight wear as well. In this case, improvement in both the size and depth of the defect could be measured with increased patient comfort and decreased burning sensation after 1 week of overnight PROSE treatment. **Discussion.** The PROSE device aids in healing persistent epithelial defects via three main mechanisms. It provides protection from external shearing forces, constant hydration to the ocular surface via its fluid reservoir, and increased oxygenation through its

channels for fluid-tear exchange. **Conclusion.** Concisely, treatment of persistent epithelial defects with day and night PROSE wear should be considered when other conventional therapies have failed.

Modeling Melanoma-Induced Monocyte Conversion to Myeloid-Derived Suppressor Cells to Identify Novel Immunotherapies

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Shannon Murray, Ph.D., Assistant Professor, College of Allopathic Medicine, Nova Southeastern University

Background. Tumors have the capacity to suppress the host immune system. Tumors secrete factors that induce the conversion of CD14+ monocytes to an immunosuppressive population of cells called myeloid-derived suppressor cells (MDSC). MDSC suppress vital immune cells such as T cells by limiting their proliferation and effector cytokine production. Heightened MDSC levels in the blood and tumor microenvironment (TME) correlate to cancer, including melanoma, progression. **Methods.** We will use a ‘tumor education’ co-culture to model the conversion of CD14+ monocytes to MDSC upon interaction with patient-derived melanoma cells to reflect that which occurs in vivo. We will quantify these ‘melanoma-educated’ MDSC by flow cytometry using markers CD11b, HLA-DR, and CD33 to distinguish MDSC from CD14+ monocytes. MDSC suppressive effects on T cell proliferation will be measured by carboxyfluorescein succinimidyl ester (CFSE), and interferon gamma production, by enzyme-linked immunosorbent assay (ELISA). **Results.** We expect an increase in the conversion of CD14+ cells to MDSCs in the presence of melanoma cells as well as a decrease in T cell proliferation and IFN-gamma production upon co-culture with MDSC generated in this model. **Conclusion.** By developing this platform to dissect the mechanisms of MDSC generation with melanoma we will be able to identify potential therapeutic interventions to decrease MDSC generation and enhance anti-cancer immunity. With the importance of developing combination cancer immunotherapies that improve T cell responses and decrease MDSC, this tractable model will facilitate this research. **Grants.** This study was partially funded by an NSU President’s Faculty Development Grant to Shannon Murray.

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Latimer, Jean	Nucleotide Excision Repair Identifies Two Distinct Types of Non-Tumor Adjacent Breast in Sporadic, Non-Germline Breast Cancer	16	Podium	Morris	11:45 a.m. - 12:15 p.m.
Latimer, Jean	Nucleotide Excision Repair Identifies Two Distinct Types of Non-Tumor Adjacent Breast in Sporadic, Non-Germline Breast Cancer	16	Podium	Morris	11:45 a.m. - 12:15 p.m.
Latimer, Jean	DNA Nucleotide Excision Repair in Ductal Carcinoma In Situ	12	Podium	Melnick	11:15-11:45 a.m.
Latimer, Jean	Determination of Shark and Ray DNA Nucleotide Excision Repair Gene Homology and Gene Expression Compared with Humans	50	Poster	Atrium	12:15-1:15 p.m.
Laureano, Nina	Gender Related Experiences of Online Gamers	41	Poster	Atrium	12:15-1:15 p.m.
Lechner, Kathryn	Congenital Heart Disease: Early Diagnosis to Decrease Infant Mortality	34	Poster	Atrium	12:15-1:15 p.m.
Leibowitz, Randy	Effects of Methionine Gamma Lyase-Deaminase on Human Colorectal Carcinoma Cells	22	Podium	Steele	1:15-1:45 p.m.
Lenox, Alexandra	HIV/AIDS and Populations at Risk in Broward County, Florida	21	Podium	Steele	10:45-11:15 a.m.

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Levi-Minzi, Maria	Connecting the Pieces: An Appreciative Inquiry of a Didactic Training Module for Pediatric Dentistry Residents Treating Children with ASD and Their Families	11	Podium	Marder	2:45-3:15 p.m.
Levi-Minzi, Maria	Parents of Children With Autism Spectrum Disorder and Their Attitude Towards Silver Diamine Fluoride as a Different Treatment Modality for Carious Lesions	39	Poster	Atrium	12:15-1:15 p.m.
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Linares, Andrea	Development of a Novel Radioligand for Characterization of the Mas Receptor for Angiotensin 1-7	13	Podium	Melnick	11:45 a.m. - 12:15 p.m.
Linares, Andrea	Effect of Ovariectomy on Brain Angiotensin Type 1 Receptor Binding, Blood Pressure, and Hippocampal Gene Methylation and BDNF mRNA Expression in Dahl Salt-Sensitive Hypertensive and Dahl Salt-Resistant Normotensive Rats	15	Podium	Morris	10:45-11:15 a.m.
Linares, Andrea	Modulation of Angiotensin II Binding and AT1 Receptor Expression in Experimental Alport Mouse Kidney	55	Poster	Atrium	12:15-1:15 p.m.
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Lundqvist, Andreas	Modeling Melanoma-Induced Monocyte Conversion to Myeloid-Derived Suppressor Cells to Identify Novel Immunotherapies	67	Poster	Atrium	12:15-1:15 p.m.
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Lymperopoulos, Anastasios	GRK5 Protects the Heart Against Excessive Aldosterone by Phosphorylating and Inhibiting the Cardiac Mineralocorticoid Receptor	13	Podium	Melnick	2:15-2:45 p.m.
Lypka, Karin	Dead Things Don't Swell	25	Podium	Terry	11:15-11:45 a.m.
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Malvasio, Chay	Laparoscopic Inguinal Hernia Repair with Mesh: A Case Review	27	Podium	Terry	2:45-3:15 p.m.
Maning, Jennifer	GRK5 Protects the Heart Against Excessive Aldosterone by Phosphorylating and Inhibiting the Cardiac Mineralocorticoid Receptor	13	Podium	Melnick	2:15-2:45 p.m.
Mariassy, Andrew	Histopathology of Neutrophil Infiltrate in the Walls of Asthmatic Airways	40	Poster	Atrium	12:15-1:15 p.m.
Markan, Uma	GRK5 Protects the Heart Against Excessive Aldosterone by Phosphorylating and Inhibiting the Cardiac Mineralocorticoid Receptor	13	Podium	Melnick	2:15-2:45 p.m.
Marquis, Michael	The Test-Retest Reliability and Minimum Detectable Change of a Dynamometric Device Used to Quantify Lifting Strength	25	Podium	Jonas / Finkelstein	11:45 a.m. - 12:15 p.m.
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Mascia, Dominic	The Test-Retest Reliability and Minimum Detectable Change of a Dynamometric Device Used to Quantify Lifting Strength	25	Podium	Jonas / Finkelstein	11:45 a.m. - 12:15 p.m.
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Mathew, Ashitha	Decreasing Injury in Children Ages 0-12 Years Old Through the Use of Proper Vehicle Restraint Systems	58	Poster	Atrium	12:15-1:15 p.m.
May, Reagan	Effects of BluTech Lenses on Melatonin, Sleep, Mood, and Neurobehavioral Performance	65	Poster	Atrium	12:15-1:15 p.m.
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Mayrovitz, Harvey	A Method to Detect Lower Extremity Edema with Possible Application to Congestive Heart Failure (CHF)	49	Poster	Atrium	12:15-1:15 p.m.
Mayrovitz, Harvey	Assessing Skin Water of Upper and Lower Extremities via Tissue Dielectric Constant (TDC): Suitability of Single vs. Multiple Measurements	54	Poster	Atrium	12:15-1:15 p.m.
Mayrovitz, Harvey	Potential Utility of Sacral Skin Temperature to Detect Patients at High Risk for Pressure Injury	63	Poster	Atrium	12:15-1:15 p.m.
Mayrovitz, Harvey	Reference Values for Assessing Localized Hand Edema or Lymphedema Using Skin Tissue Dielectric Constant (TDC) Inter-Hand Ratios	63	Poster	Atrium	12:15-1:15 p.m.
Mayrovitz, Harvey	Characterization of the Tissue Dielectric Constant of Skin Basal Cell Carcinoma	51	Poster	Atrium	12:15-1:15 p.m.
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McGory, Robb	Student Experience with a Co-Curricular Program Design to Enhance Personal and Professional Growth	54	Poster	Atrium	12:15-1:15 p.m.
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Miller, Andrew	The Reliability of the Upper Limb Tension Test: A Comparison of an Experienced Clinician and a Doctor of Physical Therapy Student	59	Poster	Atrium	12:15-1:15 p.m.
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Mokha, Monique	Dysfunctional Movement Patterns Differ Between Male and Female NCAA Division II Athletes	48	Poster	Atrium	12:15-1:15 p.m.
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Morris, Melissa	Attitudes and Knowledge with Participation in an Integumentary Interprofessional Simulation Experience Between Nursing and Physical Therapy Students	45	Poster	Atrium	12:15-1:15 p.m.
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Movila, Alexandru	OC-STAMP Promotes Osteoclast Fusion for Pathogenic Bone Resorption in Periodontitis via Upregulation of Permissive Fusogen CD9	18	Podium	Resnick	11:15-11:45 a.m.
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Nappi, Rochelle	Participation in a Co-Curricular Program Designed to Address CAPE Outcomes Domain 4	33	Poster	Atrium	12:15-1:15 p.m.
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Nappi, Rochelle	Various Learning Styles and Approaches Among Pharmacy Students Utilizing VARK	45	Poster	Palm Beach	12:15-1:15 p.m.
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Neagra, Christopher	Modulation of Angiotensin II Binding and AT1 Receptor Expression in Experimental Alport Mouse Kidney	55	Poster	Atrium	12:15-1:15 p.m.
Neagra, Christopher	The Significance of the Renin Angiotensin System in the Screening, Diagnosis, and Treatment of Colorectal Cancer (CRC)	57	Poster	Atrium	12:15-1:15 p.m.
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Ocanto, Romer	Connecting the Pieces: An Appreciative Inquiry of a Didactic Training Module for Pediatric Dentistry Residents Treating Children with ASD and Their Families	11	Podium	Marder	2:45-3:15 p.m.
Ocanto, Romer	Parents of Children With Autism Spectrum Disorder and Their Attitude Towards Silver Diamine Fluoride as a Different Treatment Modality for Carious Lesions	39	Poster	Atrium	12:15-1:15 p.m.
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Olsen, Tiffany	Stay Connected With Your Baby in the Neonatal Intensive Care Unit (NICU)	51	Poster	Ft. Myers	12:15-1:15 p.m.
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Omidian, Hamid	Structural Factors Affecting Abuse Performance of Common Pharmaceutical Superdisintegrants	36	Poster	Atrium	12:15-1:15 p.m.
Omidian, Hamid	In-Vitro Drug Release from Abuse-Deterrent Therapeutic Polymers	36	Poster	Atrium	12:15-1:15 p.m.
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Pang, Hong	Effect of Ovariectomy on Brain Angiotensin Type 1 Receptor Binding, Blood Pressure, and Hippocampal Gene Methylation and BDNF mRNA Expression in Dahl Salt-Sensitive Hypertensive and Dahl Salt-Resistant Normotensive Rats	15	Podium	Morris	10:45-11:15 a.m.
Pang, Hong	Modulation of Angiotensin II Binding and AT1 Receptor Expression in Experimental Alport Mouse Kidney	55	Poster	Atrium	12:15-1:15 p.m.
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Perez, Gabriela	A Case of Anoxic Brain Injury: The Importance of Preventing, Diagnosing and Treating Obstructive Sleep Apnea	64	Poster	Atrium	12:15-1:15 p.m.
Perez, Gabriela	The Significance of the Renin Angiotensin System in the Screening, Diagnosis, and Treatment of Colorectal Cancer (CRC)	57	Poster	Atrium	12:15-1:15 p.m.
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Popovici, Ioana	National Level Analysis of Opioids-Related Death and Hospital Adverse Drug Events, 2009-2014	62	Poster	Atrium	12:15-1:15 p.m.
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Rambo, Anne	Connecting the Pieces: An Appreciative Inquiry of a Didactic Training Module for Pediatric Dentistry Residents Treating Children with ASD and Their Families	11	Podium	Marder	2:45-3:15 p.m.
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Roehn, Thomas	Gender Related Experiences of Online Gamers	41	Poster	Atrium	12:15-1:15 p.m.
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Rone-Adams, Shari	Attitudes and Knowledge with Participation in an Integumentary Interprofessional Simulation Experience Between Nursing and Physical Therapy Students	45	Poster	Atrium	12:15-1:15 p.m.
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Silver, Tobin	Two Years on a High-Protein Diet: Much Ado About Nothing	41	Poster	Atrium	12:15-1:15 p.m.
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Speth, Robert	Modulation of Angiotensin II Binding and AT1 Receptor Expression in Experimental Alport Mouse Kidney	55	Poster	Atrium	12:15-1:15 p.m.
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Tartar, Jaime	High and Low Impact Physical Activity Positively Influences Female Bone Density	63	Poster	Atrium	12:15-1:15 p.m.
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