Second Annual

Graduate Student Research Conference

March 10, 2017

Program

Schedule

7:45 – 8:45	Breakfast and Registration Oakland Center Banquet Room
9:00 – 10:30	Concurrent Sessions: Oral Presentations Oakland Center Breakout Rooms *(See schedule)*
	15 Minute Break
10:45 – 11:50	Poster Presentations Oakland Center Fireside Lounge
12:00 – 1:30	Lunch and Keynote Speaker, Dr. Kathie L. Olsen Oakland Center Banquet Room

Moderators

Darlene Groomes, Human Development & Child Study
Laila Guessous, Mechanical Engineering
Nidhi Khattree, Graduate Study
Suha Kridli, Nursing
Christine Stiller, Physical Therapy
Judith Venuti, School of Medicine
Stephen Weiter, Library
Dao Qi Zhang, Eye Research Institute

Keynote Speaker - Kathie L. Olsen, Ph.D.

Dr. Olsen is the former Deputy Director and Chief Operating Officer of the National Science Foundation (NSF). She directed an annual budget of $6.5 billion, created major new initiatives, and served on key scientific organizations worldwide.

At the Office of Science and Technology Policy in the Executive Office of the President, she was Associate Director for Science, where she coordinated the Federal Government's array of research agencies. As Chief Scientist at the National Aeronautics and Space Administration (NASA), Dr. Olsen was the primary link between NASA and the Nation's science establishment, creating academic and agency partnerships.

Switching easily among assignments in Congress, the Office of the President, NASA, the NSF, and working with other federal agencies and international organizations, Dr. Olsen spent three decades developing a well-honed capability and facility within all aspects of the scientific establishment.

Dr. Olsen is also the Founder and Managing Director of ScienceWorks, a consulting firm that helps academic institutions, educational coalitions, companies, and research entities create successful, well-supported science programs and projects. ScienceWorks is the culmination of a distinguished career that began with Dr. Olsen's significant research on the neural basis of behavior, and grew into leadership positions in major governmental and scientific agencies.

Dr. Olsen is a champion for the rights and interests of all and promotes the broad engagement of all our citizens, including women and underrepresented minorities, as well as the diversity of institutions in the global opportunities and challenges of today and tomorrow.

Oral Presentation Schedule

Room – Gold A			
9:00	Destiny Anyaiwe Advisers: Gautam Singh & George Wilson	Computer Science and Engineering	Mass Spectra Data for Alzheimer's Disease Diagnosis
9:15	Mario Rusnak Adviser: Tamara Hew-Butler	Health Sciences, Exercise Science	Muscle Damage, Soreness and Stress Over Six Weeks of Pre-Season Training in NCAA D1 Male Swimmers
9:30	Tolulope Ifabiyi Advisers: Foluso Ogunleye & Mark Micale	Oakland University William Beaumont SOM	Prognostic Implications of Genomic Aberrations in Patients with Chronic Lymphocytic Leukemia at the Beaumont Health Cancer Center
9:45	Shelby Potkin Adviser: Inaya Hajj-Hussein	Oakland University William Beaumont SOM	Determining Reasons for Low Human Papillomavirus Vaccination Rates among Homeless Mothers
Room – Gold B			
9:00	Regina Kesson	Forensic Nursing	Use of Touch to Provide Comfort
9:15	Virginia Mitchell Co-Author: Justin Mogilski Advisers: Lisa Welling & Virgil Zeigler-Hill	Psychology	Dark Personality Traits and Ethical Risk-Taking are Positively Associated with Mate-Poached Relationships
9:30	Jennifer Vrabel Adviser: Virgil Zeigler-Hill	Psychology	Pathological Personality Traits and Vices: Do Moral Concerns Mediate the Association?
9:45	Kharananda Sharma Adviser: Bradley Roth	Medical Physics	The Mechanical Bidomain Model of Cardiac Tissue with Curving Fibers
Room – Gold C			
9:00	Jonathan Hu Adviser: Frank Burks	Oakland University William Beaumont SOM	Repeat Prostate Biopsy Practice Patterns in a Statewide Quality Improvement Collaborative
9:15	Aishwarya Navalpakam Advisers: Inaya Hajj-Hussein & Mohammed Dany	Oakland University William Beaumont SOM	Behavioral Perceptions of Oakland University Female College Students Towards Human Papillomavirus Vaccination
9:30	Brandon Nguyen Advisers: David Krauss & Karna Sura	Oakland University William Beaumont SOM	Low Chronic Gastrointestinal and Genitourinary Toxicity with High-Dose Rate Brachytherapy for Prostate Cancer
9:45	Peter Chen Adviser: Kenneth Mitton & Wendelin Dailey	Oakland University William Beaumont SOM	Effects of Vascular Endothelial Growth Factor on Cell Signaling Pathways in Retinal Neovascularization Diseases
10:00	Brian Lu Adviser: Gustavo Patino	Oakland University William Beaumont SOM	Development of a Screening Tool for Obstructive Sleep Apnea
Room – Heritage			
9:00	Spencer Darlin Adviser: John Tyrell	Oakland University William Beaumont SOM	Brachial Artery Exploration and Embolectomy
9:15	David Vinh-Phuc Nguyen Advisers: Samia Ragheb & Charles Shanley	Oakland University William Beaumont SOM	Immunohistochemical Analysis of Potential Biomarkers of Plaque Instability in Carotid Atherosclerosis Patients
9:30	Bijoy Paul Co-Author: Salahaddin Sanusei	Biological and Biomedical Sciences	In-Vitro Degradation of PLGA 85:15 in Hydrogen Peroxide (H2O2) and Estimation of Fracture Toughness with the Help of Extended Finite Element Method (XFEM)
9:45	Pawel Marcinek Adviser: Meir Shillor	Mathematics and Statistics	Analysis and Simulations of Debonding of Bonded Rods/Beams Caused by Mechanical Stresses, Humidity and Thermal Effects

Oral Presentation Schedule

Room – Lake Superior A			
9:00	Berkley Browne Advisor: Thandi Sule	Organizational Leadership	Pre-Matriculation Versus Early Intervention in Medical School: One Model Showing the Benefits of Early Intervention with Academic Support
9:15	Daniel Quinn Advisers: C. Suzanne Klein & Michael MacDonald	Organizational Leadership	How District Leaders Interpret and Implement Pay-for-Performance for Teachers: The Tale of Three Michigan School Districts
9:30	Ashley Cerku Advisers: Jon Carroll & Claude Baillargeon	Sociology and Anthropology	The Relationship between Lewis Hine and Florence Kelley in the Progressive Era in America
9:45	Tingrui Sun	Accounting and Finance	Individual Income Tax Comparison
10:00	Manoj Bahuguna Adviser: Ravindra Khattree	Mathematics and Statistics	Estimation of Beta Risk Through Copula Transformation and Winsorization
Room – Lake Superior B			
9:00	Ashley Superson Adviser: Fabia Battistuzzi	Biological Sciences	Effects of Taxon Sampling on Phylogenetic Stability and Speciation Rates
9:15	Tudor Moldovan Adviser: Amy Banes-Berceli	Biological Sciences	Gender Differences Involving Serotonin (5-Ht) Receptors In Type 1 Diabetic Rats
9:30	Marisa Brake Adviser: Randal Westrick	Biological and Biomedical Sciences	Next Generation Sequencing Analysis Indicates the Existence of Non-Exomic Thrombosuppressor Mutations in ENU Mutant Mice
9:45	Aaysha Kesarkar Co-Author: Aarthi Shibu Adviser: Huirong Fu	Computer Science and Engineering	Mobile Security: Malicious App in Android
Room – Lake Huron			
9:00	Murphy O'Dea Adviser: Laila Guessous	Mechanical Engineering	Development of an Advanced Wind Turbine Actuator Line Model
9:15	Meng Xu Adviser: Xia Wang	Mechanical Engineering	Parameter Estimation for Li-ion Battery Multiphysics Modeling
9:30	Huaqi Ge Adviser: Peng Zhao	Mechanical Engineering	A 1-D Platform to Simulate the Effects of Dedicated EGR on SI Engine Combustion
9:45	Mingyuan Tao Adviser: Peng Zhao	Mechanical Engineering	Inverse Livengood-Wu Integration Method for Analyzing Ignition Delay Times in Reactors with Varying Conditions
Room – Oakland			
9:00	Tri Doan Adviser: Subramaniam Ganesan	Electrical & Computer Engineering	CAN Crypto Hardware Design to Secure Data Transmitted through CAN FD Bus
9:15	Waseem Sadeh Adviser: Osamah Rawashdeh	Electrical & Computer Engineering	Development of a Fork-Join Dynamic Scheduling Middle-Layer for Automotive Powertrain Control Software
9:30	Tong Wu Co-Author: Mingyuan Tao Adviser: Peng Zhao	Mechanical Engineering	A Kinetic Modeling Study on Octane Rating and Fuel Sensitivity Under HCCI Condition
9:45	Ke Qu Adviser: Xiangqun Zang	Biomedical Science	Ring-Substituted Polyaniline for Sulfur Dioxide Detection and Adsorption
10:00	Swathi Vadde Advisers: Subramanian Ganesan & Debatosh Debnath	Industrial and Systems Engineering	Effect of Fault On Load Distribution with FIFO (First In, First Out) and LIFO (Last in, First Out) Methods.

Poster Presentations		
Fireside Lounge		
Jamilah Alhashidi Advisers: Inaya Hajj-Hussen & Bethany Foster	Oakland University William Beaumont SOM	Stage of HIV at Diagnosis and Retention Rate in Care in an Expanded Testing Site
Emad Alsyed	Biomedical Science	Multiscale Approach of the Bragg Peak Position of Proton
Toritsetse Aniejurengho Adviser: Deana Hays	Nursing	Enhancing Awareness of Coronary Heart Disease (CHD) with Lifestyle Modification in Young Adult African American Women
Farid Badar Co-Authors: Ji Hyun Lee & Yang Xia Adviser: Yang Xia	Medical Physics	Improve the Detection of Cartilage Degradation by Dividing the Tissue Unequally
Anita Bajpai Adviser: Aleida Rivera	Oakland University William Beaumont SOM	Primary Health Disparities and Diseases among the U.S. Hispanic Population – A Growing Problem
Syeda Batool Co-Authors: David Khan & Daniel Mittlestaedt Adviser: Yang Xia	Medical Physics	Strain- and Depth-Dependent Poisson's Ratio in Articular Cartilage
Sarah Berry	Nursing	Development of a Middle Range Theory: Predicting Fall Risk in the Older Adult
Kunal Bhatia Adviser: Mohan Tanniru	Business Administration	CareTainment – Research & Development Prototype
Johnnie Blunt	Reading & Language Arts	The Impact of an Authentic Learning Site on Pre-Service Teacher Self-Efficacy
Lori Boright Adviser: Deborah Doherty	Physical Therapy	The Effect of a Multimodal Prehabilitation Program for Individuals Diagnosed with Head and Neck Cancer: A Narrative Review
Samantha Brindley Adviser: Melissa McDonald	Psychology	Outgroup Member's Internal Criticism Promotes Intergroup Openness: The Role of Perceived Risk
Jacquelyn Cameron Adviser: Holly Gilmer	Oakland University William Beaumont SOM	Occipital Neurolysis and Resection for Treatment of Occipital Neuralgia
Jewel Cannon Adviser: Todd Leibert	Clinical Mental Health Counseling	Texting Behaviors and Attachment Styles in Intimate Relationships
David Chu Advisers: Maureen Anderson & Michael Tocco	Oakland University William Beaumont SOM	The Effects of Acupuncture Therapy on Gastrointestinal Symptoms of Patients seen in Integrative Medicine
TaSondra Foltz Adviser: Cheryl Riley-Doucet	Nursing	The Effectiveness of a Nurse Suicide Screening Tool for Veterans in the General Medicine and Surgical Patient Population
Lauren Foster Adviser: Maha Jawad	Oakland University William Beaumont SOM	Comparison of Hypo-Fractionated Breast Radiation with Boost to Conventional Radiation with Boost
Devon Freudenberger Adviser: Victoria Lucia	Oakland University William Beaumont SOM	Sports-Related Concussion Knowledge and Attitudes of Intramural and Club Sport Athletes
George Fu Adviser: Mohamed Zohdy	Oakland University William Beaumont SOM	A Pilot Study to Investigate the Neuropsychologic Effects of Binaural Beats on the Human Brain

Poster Presentations		
Fireside Lounge		
Lisa Galasso Co-Author: Rachel Rohde	Oakland University William Beaumont SOM	Evaluation and Management of Large Rheumatoid Nodules
Rafaella Genova Co-Authors: Peter Andrade & Kongkrit Chaiyasate	Oakland University William Beaumont SOM	The Use of Rigid External Distraction (RED) Device in the Management of Acute Comminuted Maxillofacial Fractures
Benjamin Ghiam Advisers: Suzan ElSayed & Stephen Loftus	Oakland University William Beaumont SOM	The Dialogical-Narrative Approach
Montana Green Advisers: Carrie Buch & Margaret Glembocki	Nursing	Determining the Effects of Facilitated Ethics Discussion Sessions on Moral Distress Levels in Progressive Care Nurses: A Pilot Study
Ankita Guha	Information Technology Management	System and Method for Automating Patent Analysis
Katherine Hebert Co-Authors: Caitlin Williams & Cecily Ciaaramitar Adviser: Jacqueline Drouin	Physical Therapy	Aerobic Exercise Training Effects on Resting Vital Signs in African American and Caucasian Women Following Breast Cancer Treatment: A Pilot Study
Derrick Huang Advisers: Scott Kleiman & Janice Crabtree	Oakland University William Beaumont SOM	Effects of Streamlining Consultation and Maintaining Hospital Bed Availability on Trauma Admission
Nicholas Ingarra Adviser: Xia Wang	Mechanical Engineering	Thermal Osmosis in Fuel Cells
Jean-Pierre Iskandar Advisor: Inaya Hajj Hussein Co-Author: Kathleen Doyle	Oakland University William Beaumont SOM	HistoConnect: An Online Integrated Module
Sarah Jahimiak Adviser: Robert Fink	Counseling	The Effects of a Structured Art Group Experience on Wellness Levels of University Students
Jonathon Juszkiewicz Adviser: Laila Guessous	Mechanical Engineering	Improving Convective Boundary Condition Prediction for Long Transient Thermal Simulation Through the Use of Response Surfaces
Iyad Mansour Co-Authors: Hamzeh Alzubi & Ahmad Kafrony Adviser: Osamah Rawashdeh	Electrical and Computer Engineering	Utilization of an Open Source Project (OSP) Autopilot in a Novel Aquatic Quadcopter Drone
Kade McQuivey Co-Author: Kelly Levasseur Adviser: Kelly Levasseur	Oakland University William Beaumont SOM	Implementing the Lever Sign in the Emergency Department (ED) to Assist in Acute Anterior Cruciate Ligament (ACL) Rupture Diagnosis
Kyaw Naing Adviser: Jason Wasserman	Oakland University William Beaumont SOM	Time Dependent Patterns of Emergency Department Use by Homeless Persons
Aditi Patil Adviser: Yonghong Yan	Computer Science and Engineering	Visualization of Data Layout and Access of Parallel Program for Productive Performance Analysis and Tuning
Andrew Pham Adviser: John Tu	Oakland University William Beaumont SOM	Identifying Factors of Effective Computerized Decision Support System

Poster Presentations

Fireside Lounge

Deirdre Pitts Adviser: Thandi Sule	Organizational Leadership	Capturing Perceptions: Unconscious Bias in Decisions for Faculty Shortlist Placement
Giovanni Randazzo Adviser: Todd Shackelford	Psychology	Sexual and Romantic Preferences in Written Erotica
Arun Kumar Sahu Adviser: Vijayan Sugumaran	Information Technology Management	Big Data Analytics in the Automotive Domain
Amandeep Sawana Adviser: Sanjeev Kaul	Oakland University William Beaumont SOM	Evaluating the Efficacy of Open versus Robotic RPLND for Treating Testicular Cancer
Leart Sejdarasi Adviser: Evan Trivedi	Chemistry	Synthesis and Characterization of Low Symmetry Subphthalocyanine and Subnaphthalocyanine Analogues
Ishani Shah Adviser: Dotun Ogunyemi	Oakland University William Beaumont SOM	Attitudes and Perceptions of Healthcare Providers Regarding Safe Reduction of Cesarean Sections
Jatin Sharma Advisers: Shanna Jones & Aveh Bastani	Oakland University William Beaumont SOM	Cost Benefit Analysis of Physician-in-Triage Model at Troy Beaumont Emergency Department
Christopher Slon Adviser: Vijitashwa Pandey	Industrial and Systems Engineering	A Method to Determine the Optimal Datum Layout to Maximize Gauge Repeatability in Dimensional Inspection of a Compliant Part
Michelle Southward	Organizational Leadership	First Generation College Students
Sara Sutton Adviser: Debatosh Debnath	Information Technology Management	Survey on the Broadcast Storm Problem in VANET
Alicia Tollefson Co-Author: Alex Delavan Adviser: Laurel Stevenson	Health Sciences	Perceived Salient Referents and Circumstances of Involvement in Detroit SOUP Neighborhood Events: A Qualitative Inquiry
Justin Yuan Advisers: Judith Venuti & Brent Thompson	Oakland University William Beaumont SOM	Clinical Significance of Anatomical Variations in the Extensor Compartment of the Forearm
Yue Zhuo	Reading & Language Arts	Factors that Influence Technology Integration in Teaching English as a Foreign Language
Iva Ziu Adviser: Sanela Martic	Chemistry	New Immunotherapies for Neurodegenerative Diseases

Oral Presentations

Presenting Author: Destiny Edisemi Oriehi Anyaiwe
Mass Spectra Data for Alzheimer's Disease Diagnosis

Mass Spectrometer has played vital role in the identification of protein biomarkers for several diseases. In this study, we go beyond protein biomarker identification and discovery to building classification model towards early and reliable diagnosis of Alzheimer's disease. The methodology of this study discusses feature selection based on direct observations of variables and their inter-relationships, Jackknife technique for data sampling cum generating test and train datasets, matrix to vector decomposition and successfully classifies Alzheimer's disease patients into three disease stages; age-matched controls without any evidence of dementia, patients with mild cognitive impairment, and patients with acute cognitive impairment or clinical symptoms of Alzheimer's disease (AD). Our model extends the use and principle of K-nearest neighbor (KNN) algorithm and presents a modification of Euclidean distance formula. Hitherto, there exists no clinical diagnostic tool for AD, in lieu of this, patient cognitive abilities are clinically followed-up over a period (may be months) to make a diagnosis. This practice usually leads to inconclusive diagnosis and results obtained from it are not generalizable. This study, provides a platform for immediate classification and correctly indicates test datasets predisposed to AD with 75% accuracy (and a probability of 0.13 for committing type II error) without collaborating clinical records.

Presenting Author: Manoj Bahuguna
Estimation of Beta Risk through Copula Transformation and Winsorization

In the financial risk-return model, the estimation of beta risk is mainly based on the ordinary least square estimate, which is very sensitive to the assumption of normality, independence of random errors, constancy of unique unsystematic risk of the asset and the presence of outliers. Equity returns and market returns often have skewed distributions and hence lead to outlier situation. This makes the least square estimate of beta biased and misleading. In this talk, we suggest the use of an all-purpose generic copula transformation along with winsorization method on the financial data. The combination of these two methods enables us to fulfill the basic assumption of the risk-return model and thus leads to the improved estimation of beta.

Presenting Author: Marisa Brake
Next Generation Sequencing Analysis Indicates the Existence of Non-Exomic Thrombosuppressor Mutations in ENU Mutant Mice

Factor V Leiden (FVL), a variant of coagulation Factor V, is a potent and incompletely penetrant risk factor for venous thromboembolism (VTE). We sought to understand the genetic basis for this incomplete penetrance with a FVL mouse model. A perinatal lethal phenotype was identified in homozygous FVL mice also heterozygous deficient for tissue factor pathway inhibitor (F5L/L Tfpi+/-). This life/death phenotype formed the basis for a binary sensitized whole genome ENU mutagenesis screen for dominant thrombosis suppressors. ENU mutagenized F5+/L Tfpi+/- males were bred to F5L/L females. Surviving F5L/L Tfpi+/- offspring inherited an ENU-induced thrombosuppressor mutation and were bred to F5L/L to create thrombosuppressor mouse lines. F5L/L Tfpi+/- mice from the MF5L22 line exhibited a penetrance of 80.8%. Plasma was analyzed for thrombosis susceptibility using the in vitro Prothrombin Time (PT) assay. F5L/L Tfpi+/- mice exhibited significantly longer PT compared to F5+/L Tfpi+/- and Tfpi+/- control mice (q-value <0.01), suggesting a potent antithrombotic effect. To identify the causative mutation, five F5L/L Tfpi+/- mice were whole exome sequenced. Twenty-two candidate mutations were genotyped in at least twelve F5L/L Tfpi+/- MF5L22 mice. Kaplan-Meier survival curves ruled out each putative exomic modifier. Because whole exome sequencing (WES) failed to identify the thrombosuppressor mutation, four F5L/L Tfpi+/- mice were whole genome sequenced. Initial analysis revealed a total of eleven exonic mutations, none of which were identified by WES. Seven of the mutations have low quality scores and four have been ruled out by Sanger sequencing. The strongest remaining candidates reside in intergenic and intronic regions, suggesting the mutation is in a regulatory element. The identification of this thrombosuppressive modifier will provide novel insights into the pathways leading to VTE and facilitate novel therapeutic interventions.

Presenting Author: Berkley Browne

Pre-Matriculation versus Early Intervention in Medical School: One Model Showing the Benefits of Early Intervention with Academic Support

Given the rigors of medical school and volume of information for which students are accountable, many novice medical students struggle with how to learn effectively rather than memorize. In response to questions regarding how to best support the learning goals of students, particularly students considered at risk for underperformance, a task force conducted an analysis to identify the most common reasons for underperformance and to determine which type of pre-matriculation support would provide the best remedy. At the conclusion of the analysis the task force determined a traditional pre-matriculation program would not meet all medical students' needs nor would it create opportunities to provide strategic interventions for students not typically considered "at risk" upon entering medical school but who underperformed nevertheless. On the contrary, providing academic support to all students is required to best address the most prevalent reasons for chronic academic difficulty. By making available a vehicle through which students can evaluate and develop their academic skills before arriving on campus combined with a robust live workshop series within the first six weeks of the school year medical schools have an opportunity work with all students on academic skill development and self-regulated learning strategies, regardless of whether they fit traditional definitions of academically "at risk." Providing all students with access to such support also positions those doing learning assistance work to foster effective partnerships with students and intervene with improvement strategies before underperformance on high stakes assessment occurs.

Presenting Author: Ashley Cerku

The Relationship between Lewis Hine and Florence Kelley in the Progressive Era in America

This presentation will discuss the relationship between social documentary photographer Lewis W. Hine (1874-1940) and children's rights activist Florence Kelley (1859-1932) during the Progressive Era (1890-1920) in America. My research probes Hine's intentions in producing his Child Labor series (1908-1918). This interdisciplinary project connects historical photography and anthropology to assess the relationship between Hine's photography and Kelley's social reform efforts, as both of them contributed to the efforts of the National Child Labor Committee, a significant component of the Progressive Era. Correspondence letters and archival documents were researched to help develop an understanding of Hine's motives, as well as his relationship with social reformers, mainly Kelley. Because of her elaborate efforts to find equality for everyone during the Progressive Era, her relationship with Hine is important in analyzing the establishment of reform platforms for child workers. During this era, industrial capitalists viewed children as vital components for furthering the industrious roles adults did not want to fulfill, including cotton spinners, newsies, and coal miners. This profit-driven agenda overworked, underpaid, and essentially ignored the human agency of child workers at this time. Reformers, like Kelley, publically demanded reform through speeches, articles, projects, and organizations. Because of her influence on the child labor problem and her important role in establishing these reform efforts, Kelley's relationship with Hine becomes even more critical not only to examine his documentary efforts, but also to celebrate the agency of women at this time.

Presenting Author: Peter Chen

Effects of Vascular Endothelial Growth Factor on Cell Signaling Pathways in Retinal Neovascularization Diseases

Introduction: Diseases of retinal neovascularization, such as diabetic retinopathy and age-related macula degeneration, currently impair vision in more than 9 million Americans. Elevated VEGFA is a key driver of neovascularization by activating the receptor VEGFR2. The PI3K/AKT pathway is activated downstream of VEGFR2, and may regulate cell survival, proliferation, and neovascularization. Currently, little is known about VEGFA activation of AKT, a serine/threonine kinase, in primary human retinal endothelial cells (HRECs). We developed an in situ assay to elucidate the dose response of AKT activation from VEGFA-165 in HRECs. **Methods:** Primary HRECs were cultured in 96-well plates. Control groups were untreated, while experimental groups were treated with VEGFA-165. AKT activation was measured as the relative amount of phosphorylated-AKT. In situ immunofluorescence was performed using primary antibodies to phosphorylated-AKT and to beta-Actin. After treatment with the appropriate infrared-tagged secondary antibodies, plates were scanned with a fluorescent laser scanner. Fluorescent signals of each well were normalized to beta-Actin to correct for cell number variation. Dose response curves using R-project statistical software environment. Relative timing and kinetics of AKT activation was measured. **Results:** Maximum activation of the AKT pathway, as measured by phosphorylated-AKT, occurred at 30 minutes for VEGFA-165 treatment. Based on the dose response curves, the ED50 (effective dose) for VEGFA-165 was 51 pM ± 23 pM. The dose response curve for the AKT pathway also demonstrated a steep, pseudo--binary activation response, where a small increase in VEGFA-165 concentration shifted phosphorylated AKT levels from baseline to maximum activation. **Conclusion:** Our dose response curve results suggest that it may be difficult to titrate VEGFA levels in the human eye. This may lead to difficulty in treating retinal neovascularization diseases using current VEGF blockade or trapping drugs, which will result in either full activation or full blockade of downstream signaling pathways within HRECs.

Presenting Author: Spencer Darlin
Brachial Artery Exploration and Embolectomy

Introduction: Acute extremity numbness and weakness requires a broad differential. We present a case in which neurological origin of acute upper extremity weakness in a 94-year old male was ruled out in order to reach the diagnosis of brachial artery embolus. The embolus was successfully extracted and the patient quickly regained feeling and function of his extremity. **Case Description:** The patient is a 94-year-old gentleman who was brought in to the ER by his son after he woke up early in the morning with sudden onset of numbness in his entire left upper extremity with muscle weakness. He was worked up for probable stroke by a neurologist, but found to have no pulses in the left arm and weakness in the left hand. After confirming the diagnosis of brachial artery embolus using Doppler ultrasound, the patient was prepared for removal of the suspected embolus. The brachial artery was incised just above the elbow and encircled with vessel loops. A small incision was made in the artery and a Fogerty balloon catheter was passed distally into the hand. The clot was removed with restoration of good back flow. An angiogram was taken which revealed good open flow into the hand and the wrist with no additional obstructions. At the end of the case, the patient had strong brachial and radial pulses. The patient left the operating table in stable condition and blood loss was minimal. **Conclusion:** Discovery of the source of this patient's acute numbness required a broad list of differential diagnoses. The patient's symptoms, advanced age, use of heparin, history of vascular disease, and arm numbness initially lead to the belief that the patient may have suffered a hemorrhagic stroke. However, proper physical examinations and diagnostic tests revealed the true origin of this patient's numbness and the embolus was extracted.

Presenting Author: Tri Doan
CAN Crypto Hardware Design to Secure Data Transmitted through CAN FD Bus

Abstract: Modern vehicles have 50 or more Electronics Control Units (ECUs) to support more features and safety functions. With increasing of data demand transmitted through the vehicle network, in 2012 Bosch Company proposed Controller Area Network with Flexible Data-Rate (CAN FD) - a communication protocol based on Controller Area Network (CAN). With the new feature of CAN FD supporting CAN data frame up to 64 bytes, we propose a hardware design - CAN crypto FPGA chip to secure data transmitted through CAN FD bus by using AES-128 and SHA-1 algorithms with a symmetric key. AES-128 algorithm will provide confidentiality of CAN message, and SHA-1 algorithm with a symmetric key (HMAC) will provide integrity and authenticity of CAN message. Then, the design will be enhanced by adding 64 bits anti-replay counter {48 bit global time stamp, 16 bit local counter} to prevent Replay attacks, and using dynamic cryptographic keys to strengthen robustness of secret of those keys. The design has been modeled and verified by using Verilog HDL, and implemented successfully into Altera FPGA chip (EP4CE115F29C7) by using Altera Quartus simulation tool. The performance of CAN crypto design shows that it is applicable to be embedded into ECUs for securing in-vehicle networks. **Keywords:** Controller Area Network (CAN), Controller Area Network with Flexible Data-Rate (CANFD), Electronics Control Units (ECU), Replay attacks, Advance Encryption standard (AES-128), Hash Function (SHA-1), Symmetric Cryptography, HMAC, FPGA, Verilog, Altera Quartus.

Presenting Author: Huaqi Ge
A 1-D Platform to Simulate the Effects of Dedicated EGR on SI Engine Combustion

The thermal efficiency of spark-ignition engines can be enhanced by increasing the rate of exhaust gas recirculation (EGR) such that the low temperature combustion regime could be achieved. However, there is an upper limit on the amount of EGR rate, beyond which flame speed becomes slow and unstable, and local quenching starts to hurt the combustion stability, efficiency, and emission. To resolve this issue, the concept of dedicated EGR has been proposed previously to be an effective way to enhance flame propagation under lean burn condition with even higher levels of EGR with reformate hydrogen and carbon monoxide. In this study, the effects of thermochemical fuel reforming on the reformate composition under rich conditions ($1.0 < \phi < 2.0$) have been studied using detailed chemistry for iso-octane, as the representative component for gasoline. The rich combustion products are then used to represent the composition of the dedicated EGR, whose influence on laminar flame speed and ignition delay time is further analyzed and reported. It is seen that the D-EGR could accelerate flame propagation, while retarding auto-ignition delay in the NTC regime. Moreover, the performance and the dynamic process of the dedicated EGR in an SI engine system has been simulated using a one-dimensional model in the commercial software GT-Suite. Parametric studies have been performed to provide guidance on the optimal operation conditions for SI engine with dedicated EGR.

Presenting Author: Jonathan Hu
Repeat Prostate Biopsy Practice Patterns in a Statewide Quality Improvement Collaborative

Introduction and Objective: To understand how well urologists adhere to guidelines recommending repeat prostate biopsy in patients with multifocal high-grade prostatic intraepithelial neoplasia (MF-HGPIN) or atypical small acinar proliferation (ASAP), we examined re-biopsy practice within the Michigan Urological Surgery Improvement Collaborative (MUSIC). **Methods:** We analyzed data of all men undergoing a first-time prostate biopsy at 36 MUSIC practices. We examined variation in repeat biopsy and cancer detection rates. We fit a multivariate regression model to calculate the proportion of patients undergoing re-biopsy in each practice adjusting for patient characteristics. We used claims data to validate treatment classification in the MUSIC registry. To better understand reasons for not undergoing re-biopsy, we reviewed records of a random sample of patients with ASAP. **Results:** We identified 5,375 men with a negative biopsy, of which 411 (7.6%) had a repeat biopsy. Men with HGPIN (n=718), ASAP (n=350) or MF-HGPIN and/or ASAP (n=587) at initial biopsy had re-biopsy rates of 20.7%, 42.5% and 55.6%, respectively. The adjusted proportion of patients undergoing re-biopsy in each practice ranged from 0% to 17.2% ($p<0.001$). Overall cancer detection at re-biopsy was 39.3%, and was highest after ASAP (OR:0.39; 95% CI:0.30-0.48), or both MF-HGPIN and ASAP (OR:0.50; 95% CI:0.35-0.65). Gleason $\geq$7 detection was greatest in patients with both MF-HGPIN and ASAP (41.1%). Chart review revealed that 45.5% of ASAP patients underwent PSA monitoring instead of re-biopsy, while 36% failed to undergo a re-biopsy despite a recommendation (Figure). **Conclusion:** Repeat prostate biopsy rates vary across MUSIC practices with relatively low utilization in men with MF-HGPIN and/or ASAP. Quality improvement strategies should target patients with ASAP or both ASAP and MF-HGPIN, as these have the highest likelihood of cancer detection.

Presenting Author: Tolulope Ifabiyi
Prognostic Implications of Genomic Aberrations in Patients with Chronic Lymphocytic Leukemia at the Beaumont Health Cancer Center

Introduction: Chronic lymphocytic leukemia (CLL) is the most common adult leukemia in western countries, with a highly variable clinical course. It is characterized by uncontrolled proliferation and accumulation of lymphocytic cells, which have acquired genomic aberrations. This study aims to assess the incidence of chromosomal abnormalities along with the associated outcomes in patients with CLL treated at Beaumont Health. **Methods:** A retrospective review of all patients diagnosed with CLL between 2010 and 2015 at the Rose Cancer Treatment Center was conducted, with a total of 151 patients identified. Demographic variables, types of cytogenetic abnormalities and their distribution were documented. SPSS 21 was used for data analysis and a Kaplan-Meier curve was plotted for survival. 12 and 36-month overall survival rates were analyzed by actuarial methods. **Results:** The median age at diagnosis was 74 years, of which 59.6% (90) were male and 40.4% (61) female. Using a 12 and 36-month survival analysis, patients with a sole 13q deletion had a survival rate of 90.9% for both time periods. Conversely, Patients with a 17p deletion had the worst survival rate with 0% survival at 36-months. Those with an 11q deletion showed a 75% survival rate at 12 and 36-months, while those with trisomy 12 had an 81.8% survival rate for both time periods. In patients with both 11q and 13q deletions, the 12-month survival rate was 100% while the 36-month survival rate was 80%. Similarly, those with trisomy 12 and a 13q deletion had a 100% survival rate for both periods. **Conclusion:** Patients with a 17p deletion have the worst prognosis, while those with a sole 13q deletion have the best prognosis. Interestingly, when an 11q deletion or trisomy 12 exists in combination with a 13q deletion, a patient's prognosis appears to improve compared to a sole 11q deletion or trisomy 12.

Presenting Author: Aaysha Kesarkar
Mobile Security: Malicious App in Android

Due to the progress in mobile computing, web services are increasingly delivered to the users through the mobile apps. Many of these apps are developed and built to work with other apps and services, leveraging the third-party's resources to enrich their functionalities. Users grant third parties access to their personal data through the use of these apps. This is raising concerns and issues of privacy risk of the user and the smart device. In this progress report of our continuing research, we provide the category of Android apps and the analysis tools, which will help us to study the behavior of malicious apps and perform their comparison with the genuine apps developed for the Android platform.

Presenting Author: Regina Kesson
Use of Touch to Provide Comfort

The purpose of the project was to teach direct care workers from a long-term care facility to use physical touch as a therapy to provide comfort to geriatric patients. Touch in long-term care institutions typically facilitates the basic activities of daily living or required treatments for the patient but often lacks the warmth and empathy of comfort

touch. 45% of direct care workers that attended the teaching did not know what comfort touch was. Post-surveys signified an increase in knowledge about comfort touch and the benefits therein. 93% indicated a desire to use the technique more often. These results indicate that the knowledge and use of comfort touch by nursing staff in the geriatric population are lacking. Comfort touch education for direct care workers can improve the quality of life for nursing home residents.

Presenting Author: Brian Lu
Development of a Screening Tool for Obstructive Sleep Apnea

Introduction: The current diagnosis of Obstructive Sleep Apnea (OSAS) is through a polysomnography (PSG) and a continuous positive airway pressure (CPAP) titration study. This process takes two separate nights (one for the basal PSG, another for the CPAP titration study) or a split night (initial PSG with CPAP for the remainder of the night). No clear guidelines exist in determining whether patients should undergo two separate nights or a split night study. The establishment of a screening tool that maximizes the use of split night assays will allow patients to save time while maximizing study results. **Methods:** In a previous study, one of the authors identified risk factors for OSAS through multivariable regression analysis of patients (n=321) referred for a basal PSG. This project utilized an iterative algorithm, which assigned weights and evaluated the sensitivity and specificity for each risk factor, alone and in combination with one another. Using a separate database (n=422), the risk factors most predictive of OSAS were identified and their relative effects lead to the formation of a threshold value which most accurately predicts OSAS. This algorithm was written using open-source programming to facilitate distribution and accessibility. **Results:** More than thirty two thousand models were evaluated. The two models most predictive of OSAS were selected for further analysis. Both models demonstrated that snoring frequency and apnea were most indicative of OSAS, while age, waking of partner, and gasping were less indicative. Both models yielded similar sensitivities and specificities, but utilized different threshold values and risk factor weights to predict OSAS. A questionnaire based on these models will act as a clinical screening tool. **Conclusion:** The iterative analysis further refined the results from the regression analysis. A screening tool for OSAS will help identify patients who can benefit from a direct referral to the split night study.

Presenting Author: Pawel Marcinek
Analysis and Simulations of Debonding of Bonded Rods/Beams Causes by Mechanical Stresses, Humidity and Thermal Effects

There is a considerable industrial interest in developing light-materials, such as metals with low density (magnesium, aluminum) or polymer materials in new parts and components to make them stronger and more fuel economic. Light materials require a special bonding technology, especially for joining dissimilar materials. It is observed that the bonding strength decreases in time due to mechanical stresses, thermal and humidity effects. Therefore, there is a need for mathematical models to gain deeper understanding of the deterioration process of adhesives and to qualitatively predict it. In this lecture we present the model for the process of debonding two rods/beams that are glued together. We discuss the physical and mathematical details of the model, mention the proof of existence of weak solution and then present extensive numerical simulations of the model behavior and compare to experimental data.

Presenting Author: Virginia Mitchell
Dark Personality Traits and Ethical Risk-Taking are Positively Associated with Mate-Poached Relationships

Negative aspects of personality may damage individual's ability to form close social connections, and have largely been considered maladaptive (Gleason et al., 2014). Recent evidence, however, suggests that negative facets of personality may facilitate mate-poaching (i.e., acquiring long-term sexual access to a mate who was in a relationship with someone else when courtship began). To further examine the relationship between negative personality traits and mate-poaching, we had 1,535 participants complete an online survey that assessed negative personality traits using the Personality Inventory for the DSM-5 (PID-5; Krueger et al., 2012), risk-taking behaviors using the Domain Specific Risk-Taking scale (DOSPERT; Blais & Webber, 2006), and mate-poaching behaviors. A one-way MANOVA revealed that traits on the PID-5 were significantly different between individuals whose current relationship began as the result of mate-poaching ($n = 119$) compared to those who were emotionally interested in their partner while their partner was in a relationship ($n = 165$), and those whose relationship did not begin as a result of mate-poaching ($n = 1,251$; $F(3058) = 13.394$, $p < .0001$, $\eta p2 = .042$). Follow-up Tukey's tests with Bonferroni corrections ($p = .05/10$) indicated that individuals who were physically intimate with their partner while their partner was in a relationship with someone else had significantly higher levels of detachment ($M = 1.25$, $SD = .70$), antagonism ($M = 1.18$, $SD = .76$), and disinhibition ($M = 1.27$, $SD = 0.81$) than those who were only emotionally

interested in their current partner while their partner was in a relationship (detachment: M = .83, SD = .65, p < .0001; antagonism: M = .76, SD = .64, p < .0001; disinhibition: M = .915 , SD = .675; p < .0001) and those who did not mate-poach (detachment: M = .78, SD = .57, p < .0001; antagonism: M = .60, SD = .58 p < .0001; disinhibition: M = .72, SD = .61, p <.001). Moreover, there was a difference in risk-taking scores between participants who mate-poached their partner and those who did not ($F(3058) = 14.804$, $p < .0001$, $\eta p2 = .046$). Post-hoc Tukey's test with Bonferroni corrections (p = .05/10) showed that mate-poachers had significantly higher levels of ethical risk-taking behavior (M = 20.61, SD = 9.17) than those who were only emotionally interested in their current partner while their partner was in a relationship (M = 14.22, SD = 6.78, p < .0001) and those who did not mate-poach (M = 13.03, SD = 6.25, p < .0001). In other words, individuals higher in ethical risk-taking were more likely to become physically, but not romantically, involved with a partner while that partner was in another relationship. These results support the notion that maladaptive personality traits may facilitate mate-poaching and suggest that levels of ethical risk-taking may also play a role in individuals' willingness to mate-poach.

Presenting Author: Tudor Moldovan
Gender Differences Involving Serotonin (5-Ht) Receptors in Type 1 Diabetic Rats

Diabetes mellitus is an important topic of research. In both Type I and Type II diabetes, vascular and renal dysfunction are some of the many negative impacts observed in diabetic patients. Increased plasma levels of 5-HT exist in male diabetic rodent models and previous data in male Japanese diabetic patients demonstrated that inhibition of 5-HT2A receptors reduced proteinuria observed. Whether there are differences in males and females in 5-HT levels and function is unknown. We hypothesized that increased levels 5-HT receptors may be the cause of the vascular damage observed in diabetics; elevated levels of 5-HT and 5-HT receptors may lead to increased vasoconstriction. We used male and female Sprague-Dawley rats (300-325g) and made them diabetic with Streptozotocin (STZ). At 14 days and 28 days post-onset of diabetes we euthanized the animals, harvested tissues and blood vessels for Western blot and myograph analysis. At day 14, no significant differences in contractile responses in the blood vessels from either the male or female control vs diabetic rats in the thoracic aorta, renal, superior mesenteric, or femoral arteries existed. At day 28, there was an increased contractile response to 5-HT in the aorta from the diabetic rats compared to control from male and females. The females also showed increased contraction to 5-HT in the superior mesenteric artery at 28 days. There was no change observed in the renal artery or femoral artery from either sex at 28 days. In the renal cortex from the female rats, we saw increased levels of the 5-HT2A receptor at both 14 and 28 days and increased levels of the 5-HT2B receptor levels at 28 days. These data clearly show altered expression of 5-HT receptor during the development of diabetes and clear sex differences as well.

Presenting Author: Aishwarya Navalpakam
Behavioral Perceptions of Oakland University Female College Students towards Human Papillomavirus Vaccination

Human Papillomavirus (HPV) vaccination decreases the risk for cervical cancer. However, the uptake of HPV vaccine remains low when compared with other recommended vaccines. This study evaluates the knowledge and attitudes towards HPV infection and vaccination, and the readiness for the uptake of HPV vaccine amongst female students attending Oakland University (OU) in Michigan, United States. This is a cross-sectional study targeting a randomized sample of a 1000 female OU students using an online questionnaire. The data was statistically analyzed using SPSS software. A total of 192 female students, with the mean age of 24 years completed the survey. The majority of participants had previous sexual experience with occasional use of contraceptives (78.1%), were non-smokers (92.7%), and non-alcohol drinkers (54.2%). The participants had a mean knowledge score of 53.0% with a standard error of 2.3% translating to a moderately informed population. The majority agreed that HPV is life threatening (79%), the vaccine prevents cervical cancer (62%), and that side effects would not deter them from vaccination (63%). Although two thirds (67%) believed that, based on sexual practices in the United States, female college students in Michigan have a higher chance of contracting HPV, about 50% did not believe they themselves were at risk. Higher knowledge correlated with increased recommendation for the vaccine (correlation-factor 0.20, p = 0.005). Results suggested that the best predictor for improvement of vaccination was the awareness level and health education. This indicates a need for an educational intervention to raise awareness, increase HPV vaccine uptake, and decrease the incidence of cervical cancer.

Presenting Author: David Vinh-Phuc Nguyen
Immunohistochemical Analysis of Potential Biomarkers of Plaque Instability in Carotid Atherosclerosis Patients

Introduction: Carotid atherosclerosis is a disease process characterized by hardening and narrowing of arteries due to fatty plaque formation on vascular endothelial cell walls. Chronic inflammation may cause the plaques to rupture,

which increases the risk for embolic cerebrovascular events leading to stroke. The molecular mechanisms between the host immune system and plaque instability in atherosclerosis patients remain unclear. Specific peripheral blood biomarkers that can indicate whether or not a patient may be at risk for plaque instability would serve as a quick and cost-effective screening tool to determine the urgency of invasive vascular surgical interventions. **Methods:** Relative protein expression of pro-inflammatory and anti-inflammatory immune mediators were assessed in carotid arterial plaques from asymptomatic and symptomatic patients using immunofluorescence staining of paraffin-embedded sections. Plaque samples were previously collected from consented patients by vascular surgeon, Dr. Charles Shanley, in an IRB-approved study. Commercially available anti-human monoclonal antibodies were used to detect IRAK3, GSK3a, STAT1, STAT6, TGFß, CXCL12, and CXCR4. Relative fluorescent marker expression will be normalized to the nuclear marker, DAPI, prior to applying an unpaired t-test to determine statistical significance between asymptomatic and symptomatic groups. Statistical significance will be accepted at a p value of <0.05. **Results:** Immunofluorescence staining and raw data collection for each respective antigen has been completed. The data is currently being analyzed and we predict there will be differences in pro-inflammatory and anti-inflammatory mediator expression between symptomatic and asymptomatic groups, which may suggest an unstable plaque phenotype. **Conclusion:** Previous studies have evaluated gene expression profiles in plaques from transient ischemic attack and stroke patients after onset of symptoms. However, the immunological mechanisms that occur in plaques prior to symptom onset remain poorly understood. Specifically, little is known about the differential gene expression of soluble immune mediators in plaques as it correlates with plaque instability. We hypothesize that plaques from asymptomatic patients will have different immune biomarker expression profiles compared to symptomatic patients. If this proves to be true, it would allow for the development of novel prognostic tools to identify carotid atherosclerosis patients who are at risk for plaque instability and stroke.

Presenting Author: Brandon Nguyen

Low Chronic Gastrointestinal and Genitourinary Toxicity with High-Dose Rate Brachytherapy for Prostate Cancer

Purpose: High-dose rate (HDR) brachytherapy has been shown to be an effective treatment for patients with localized prostate cancer. This study seeks to review patient experience with HDR brachytherapy for prostate cancer, examine gastrointestinal (GI) and genitourinary (GU) toxicity in these patients, and evaluate current dose levels. **Methods:** 194 patients received one implant and 4 four fractions of 9.5 Gy of radiation within over 48 hours between the dates of May 2002 to December 2008. Each patient underwent live TRUS-based planning during treatment and was treated with rectal probe removed. Of our initial set, 134 patients had long-term toxicity outcomes. Toxicity was scored according to common terminology criteria for adverse events (CTCAE) from the National Cancer Institute version 3.0. Predictors for acute and chronic grade 2+ GI toxicity and 2+ GU toxicity were analyzed using univariate logistic regression analysis. $p<0.05$ was considered significant. $p<0.05$ significance$p<0.05$ was considered significant. **Results:** Median follow-up was 4.7 years. In examining GI toxicity, approximately 2% of patients had acute 2+ GI toxicity, and only 6% of patients had chronic 2+ GI toxicity with no G3+ toxicity present. As for GU toxicity, 18.7% of patients had acute grade 2+ GU toxicity with 2.9% of the patients having experienced acute grade 3 GU toxicity. 17% had chronic grade 2+ GU toxicity with 3.5% of the patients experiencing chronic grade 3 GU toxicity. **Conclusion:** HDR brachytherapy for prostate cancer is at low risk for GI toxicity. Higher urethral doses were associated with acute GU toxicity. With the low rate of toxicity, our current brachytherapy constraints seem conservative, and dose escalation could be considered.

Presenting Author: Murphy O'Dea

Development of an Advanced Wind Turbine Actuator Line Model

Large-scale wind turbine installations are sited using layouts based on site topology, real estate costs and restrictions, and turbine power output. Existing optimization programs have limited capabilities to site multiple turbines and are based on simple geometric turbine wake models, which typically overestimate individual turbine output. Alternatively, complete Computational Fluid Dynamics (CFD) modeling of entire wind turbine fields requires enormous computational resources, which has led to the development of blade modeling techniques which are combined with CFD field computations. The most promising method, using the Actuator Line model, typically uses an exponential function to spread blade forces over CFD grid points. In addition, little development work has been performed to determine the optimal grid point density and force spreading radius for these methods. In this extended abstract, we report on our ongoing efforts to develop an advanced Actuator Line formulation which uses an alternate geometric method for distributing blade forces to the CFD field. Previous work and results are updated with further developmental work towards finding the optimum grid resolutions, time step, and force application parameters for the new Actuator Line model. The Actuator Line codes are combined with a parallel spectral-element CFD program, NEK5000. A Large Eddy Simulation turbulence model is used. Results are reported for a typical large commercial wind turbine.

Presenting Author: Bijoy Paul

In-Vitro Degradation of PLGA 85:15 in Hydrogen Peroxide (H_2O_2) and Estimation of Fracture Toughness with the Help of Extended Finite Element Method (XFEM)

In the biomedical field, new materials such as polymer materials of polylactic acid (PLA), polyglycolic acid (PGA), and poly (lactic-co-glycolic) acid (PLGA) considered to be significant contributors to the development of biodegradable medical implants. Their growing usage inside human body have always been a tough challenge for the orthopedic doctors and material scientists to understand the behaviors of the polymer, vis a vi its physical, chemical, and mechanical properties. The significant jump in the usage is due to the fact that they are easily available and manufactured, help in quick healing etc. On the flip side, there were instances where the recipients of the implant, made from such biodegradable polymers suddenly complained about excruciating pain during the recovery period. Upon diagnostic checkup, it was revealed that the implant had cracked, consequently, failed in its intended purpose. Therefore, there is an urgent question, "why did it crack"? Biodegradable polymers, used as fixation devices, undergo degradation due to physiological processes inside human body while the fractured bone, subjected to kinesiological stresses, is being healed. Lots of new methods and procedures are being developed, and tests are being conducted to understand its untimely failure. In this study, in-vitro degradation of biodegradable polymer, poly lactide-co-glycolide (PLGA 85:15), was carried out to mimic in-vivo degradation. A simple mathematical relationship was established for Mode-I fracture to understand change in Young's modulus during degradation process. PLGA 85:15 specimens were designed and manufactured for mode-I fracture criterion. Fracture toughness is a mechanical property which describes resistance to crack. The key component of this study was to estimate the fracture toughness of this biodegradable polymer as it underwent degradation with the help of extended finite element method (XFEM) to help prevent costly failures in future.

Presenting Author: Shelby Potkin

Determining Reasons for Low Human Papillomavirus Vaccination Rates among Homeless Mothers

Introduction: Every year, human papillomavirus (HPV) infects an estimated 14 million people in the US. High-risk subtypes are linked to many kinds of cancer, particularly cervical cancer in women. Low-income women have disproportionally higher rates of HPV-related cancers and deaths, and lower rates of HPV vaccination. The primary goal of this study is to determine the most influential reasons why residents at Lighthouse PATH, a transitional housing program for homeless women, are not receiving the HPV vaccination for themselves or their children. **Methods:** 15 female residents from Lighthouse PATH who self-report that they have not received the HPV vaccine, took on-site surveys on HPV and the HPV vaccine. The survey included true/false questions, Likert scale items, and open-ended questions related to knowledge and attitudes about HPV and the HPV vaccine as well as demographic information. Survey data were reviewed for trends of behavioral determinants regarding HPV using appropriate statistical analysis. **Preliminary Results:** Lighthouse PATH residents identified multiple barriers to care in receiving the HPV vaccination, including low levels of HPV awareness, perceived availability of vaccines, lack of transportation, mistrust in healthcare providers, difficulty getting time off of work, and lack of HPV knowledge. **Conclusion:** The results depicted a gap in HPV knowledge and multiple barriers to receiving the HPV vaccine. Lighthouse PATH can use these results to provide targeted health information to address key participant concerns, provide a cost-effective way to increase HPV vaccination rates to lower the risk of HPV-related cancers, and ultimately improve accessible healthcare to Lighthouse's residents. More specific recommendations are expected to come in the final report.

Presenting Author: Ke Qu

Ring-Substituted Polyaniline for Sulfur Dioxide Detection and Adsorption

Conducting polymers have found many applications in the analytical fields as sensors, ion-selective electrode materials and so on. In this presentation, we show the profound influences of the small organic substituents to have on the collective properties of the whole polymers and their uses in the analytical fields for the environmental monitoring applications. Specifically in our approach, the monomer chemical structure of aniline has been modified through the installation of the different organic functional groups. For one hand, the appropriate substituents on the polyaniline adjust the sizes of the polymeric pores, affecting the gas permeability and thus the sensors' sensing performances. For the other, the electronic properties and pKa of the polyanilines can be also influenced by these substituents. Two kinds of ring-substituted polyaniline gas sensors, poly (2-methoxyaniline) and poly (2-methylaniline), on the quartz crystal microbalance (QCM) gold electrode have been fabricated and their real-time mass responses to the sulfur dioxide are evaluated. The results showed that the as-constructed poly (2-methoxyaniline) gas sensor selectively gave the good signals for the analytical detection and the adsorption of SO2 at the low and high concentrations respectively. With the proof of the concept of "simple things do great", we propose to utilize the unique gas sensing properties of poly (2-methoxyaniline) to detect the sulfur dioxide at the low concentrations and perform as the adsorbing material at the higher concentrations instead for the removal of sulfur dioxide from the environments and a promising unique and novel filter or storage reservoir for this pollutant.

Presenting Author: Daniel Quinn

How District Leaders Interpret and Implement Pay-for-Performance for Teachers: The Tale of Three Michigan School Districts

In 2009, in hopes of securing competitive federal funding from Race to the Top (RttT), a competitive grant program, states across the country began making far-reaching teacher-related policy changes to become eligible. Among the state-level changes, in Michigan and in other states were provisions to alter how teachers were evaluated, compensated, and rewarded (Michigan Revised School Code Act 451 of 1976, § 380.1250, n.d.). While a debate surrounding performance-pay (also referred as merit pay) had persisted for some time, it became a matter of state law in Michigan that local school districts should base their compensation and additional compensation decisions, at least in part, on factors related to job performance. This study investigated variation in implementation of teachers' pay for job performance, factors associated with that variation, as well as the challenges of implementation. The research had three primary purposes: (1) to assess how laws calling for pay-for-performance were received and interpreted in three Michigan districts, (2) to examine the varieties of performance related pay crafted in response to the state legislation, and (3) to explore the challenges faced by local leaders responsible for implementing performance related pay. Using a multisite qualitative approach, this study examined how state laws in Michigan are shaped in three local school district settings and how district leaders handled persistent legislative, policy, and rulemaking changes. Honig's (2006) policy, people, and places (PPP) model was used as a theoretical construct to interpret findings. Using data from semi-structured interviews and publicly available documents findings were compared using qualitative approaches. Initial findings indicated that district leaders understood the policy intent and complied with the law, however, only one of the three districts actually made substantial changes to the way it compensated and rewarded teachers.

Presenting Author: Mario Rusnak

Muscle Damage, Soreness and Stress Over Six Weeks of Pre-Season Training in NCAA D1 Male Swimmers

In 2014, three male swimmers were hospitalized with symptomatic exertional rhabdomyolysis (Stanfa M et al 2016). **Purpose:** To serially monitor and assess relationships between skeletal muscle damage, upper and lower body soreness, and physiological stress during the first six weeks of high volume training in collegiate male swimmers. **Methods:** Seventeen male NCAA D1 swimmers presented to the lab six times during pre-season training. Blood was drawn weekly for measurement of serum creatinine kinase (CK), myoglobin (MYO) and a complete metabolic panel. Serum cortisol (C), testosterone (T) and T/C ratio were assessed at Weeks 1 (baseline), 4 and 6. Upper body soreness (US) and lower body soreness (LS) were assessed weekly via a visual analogue scale (0-10-inch unmarked scale). Repeated measures ANOVA with a Bonferroni correction were performed, with data reported as means±SD. Correlation analyses performed with significance set at $p<0.05$. **Results:** Weekly training load consisted of: 88% swimming, 6% running, and 6% weight training which gradually increased from 16 hours to 20 total training hours/week over the first six weeks of training. Significant changes in CK (174±2; 438±259; 358±309; 274±112; 276±127; 301±126U/L; $p<0.0001$), MYO (38±16; 47±18; 38±18; 33±12; 31±10; 30±7ng/mL; $p=0.001$), US (1.5±1.6; 3.5±2.0; 3.7±2.2; 5.1±1.7; 5.4±2.5; 4.8±2.5; $p<0.0001$), LS (1.7±2.0; 5.5±2.5; 3.9±2.0; 4.9 ±1.7; 4.6±2; 5.5±2.2; $p<0.0001$), cortisol (15±6; 10±3; 9±4ng/dL; $p=0.0004$), and T/C ratio (37±17; 48±21; 58±32; $p=0.04$) were noted while changes in testosterone were not significant over time (456±127; 438±119; 416±111ng/dL; $p=0.38$). Significant correlations noted between CK vs. MYO ($r=0.36$), cortisol ($r=0.39$), alanine aminotransferase ($r=0.22$), and aspartate aminotransferase ($r=0.48$) when data were combined. **Conclusion:** Muscle damage in collegiate male swimmers was modest despite cumulative training which peaked at 20 hrs/week. A disconnect was noted between muscle damage (CK, MYO) and (upper and lower) body soreness, at moderate (~5 out of 10) degrees of muscle soreness. Serum cortisol decreased over time, while testosterone remained unchanged, which promoted an anabolic hormonal environment despite gradual increases in high volume training at the start of the academic year.

Presenting Author: Waseem Sadeh

Development of a Fork-Join Dynamic Scheduling Middle-Layer for Automotive Powertrain Control Software

Multicore microcontrollers are rapidly making their way into the automotive industry. Efficient utilization of multicore microcontrollers could handle the increased complexity of the powertrain control software, reduce their execution time and power consumption, as well as make them more reliable. We have adopted the Cilk approach (MIT 1994) to develop a pure ANSI C Fork-Join dynamic scheduling runtime middle-layer with a work-stealing scheduler targeted for automotive multicore embedded systems. This middle-layer could be running on top of any AUTOSAR compliant multicore RTOS. It aids software engineers in designing software as well as help migrate legacy powertrain software into multicore environments. We recently have successfully integrated our runtime layer into parts of legacy Ford powertrain software at Ford Motor Company. We have used the 3-core AURIX TC27x multicore chip from Infineon and the ETAS RTA-OS 5.3.1 multicore RTOS. For testing purposes, we have forked

some parallelizable functions inside two periodic tasks in Ford legacy powertrain software to be dynamically scheduled and executed on the available cores. Our preliminary evaluation showed 1.3-1.4x speedups for these two forked tasks. It also showed that this runtime layer scales well to the available cores and that it abstracts away the details involved in load balancing and inter-core communications from programmers. This paper outlines our preliminary design and results of evaluating the dynamic scheduler approach for powertrain control software on multicore chips. This work is ongoing research and this paper presents challenges such as meeting deadlines, reliability, and safety that arise when adopting dynamic scheduling for such time and safety-critical software.

Presenting Author: Kharananda Sharma
The Mechanical Bidomain Model of Cardiac Tissue with Curving Fibers

Mechanotransduction is the mechanism by which mechanical forces cause the heart to remodel. Mechanical forces act at different length scales from the molecular level to the whole heart. In our mathematical model, the mechanical bidomain model, the intracellular and extracellular spaces are coupled by integrin proteins in the cell membrane. In our preliminary studies, we applied the mechanical bidomain model to simple tissue geometries where the myocardial fibers were straight and uniform, in which case the model equations could be solved analytically. In this study, we apply numerical methods to solve the equations of the mechanical bidomain model. We also check the accuracy of our algorithm by performing a series of calculations. In the heart, cardiac muscle fibers curve creating zones of membrane forces resulting in regions of mechanotransduction. We use the finite difference method to solve the bidomain equations numerically for a complex fiber geometry. We consider the magnitude of the active tension T is constant but its direction makes an angle with the x-axis that varies with the position. The difference in the intracellular and extracellular displacements result from the bidomain behavior of the tissue that gives rise to forces on the integrin proteins in the membrane. Our long-term goal is to use the mechanical bidomain model to suggest experiments and make predictions about remodeling in the heart.

Presenting Author: Tingrui Sun
Individual Income Tax Comparison

The goal of this research paper is to help improve the reasonableness of individual income tax structure in China by comparing to the items of individual income tax forms and schedules in USA. In China, people with earned income over $500 monthly should pay individual income tax with a tax rate ranging from 3% to 45%. Though there is a standard deduction for $100, the individual income tax filing does not take dependents or mortgage into consideration. As a result, the individual income tax payers have suffered from burdensome individual tax and can't enjoy any refund even if they have dependents to support financially or have mortgage to pay. However, comparing to Chinese individual income tax filing requirements, the items listed on the 1040 form as other as schedules are more reasonable, which allow tax payers to avoid double taxation therefore to reduce the tax payers burden financially The research paper utilizes the resource of internet to compare the actual income tax withheld figures, the items in the USA individual income tax forms and schedules and those in the Chinese individual income tax forms to illustrate the reasonableness of USA individual income tax requirements. The research paper uses the hypothesis examples to actually calculate the income tax and tax return in two families in USA and China, respectively, to compare the individual income tax deductions, credits, returns to illustrate the individual income tax filing items needs to be modified in China. The finding shows Chinese individual income tax payers have to pay more income tax annually comparing to those with the same background in USA due to tax filing items requirements. The research paper does recommendations to adding more credits and to having more deductions or to paying individual tax as a family based on the research results.

Presenting Author: Ashley Superson
Effects of Taxon Sampling on Phylogenetic Stability and Speciation Rates

The Tree of Life (TOL) is a graphic reconstruction of the evolutionary history of the vast diversity of extant species providing a value tool to understanding how speciation events shaped our Earth. The expansion in genomic data from enhanced sequencing technologies carried an expectation that evolutionary reconstruction models would converge towards a stable TOL. Unfortunately, this expectation has not been realized, especially within microbes that, because of complex evolutionary processes and skewed taxon sampling diversity among phyla, still present unstable deep phylogenetic relationships. Prokaryotic speciation events are associated with critical evolutionary innovations and influence evolutionary changes in environmental conditions. We utilized a dataset of 766 fully-sequenced proteomes from six phyla that compose the Terrabacteria superphylum. Current TOL reconstruction studies have exposed conflicting phylogenies for this superphylum, particularly in the placement of the Deinococcus-Thermus (DT) phylum, possibly caused by the DT species representation that is much lower compared to that of other phyla. To investigate this, we created a pipeline that allowed us to perform various permutations on

this dataset to determine how altered sampling scenarios affect the accuracy of phylogenetic reconstruction and speciation rates. Each sampling scenario provided a simple framework for analyzing diversification patterns and rates in prokaryotes. For patterns, we used a discrete Robinson-Foulds metric to quantify the level of discord among permutated maximum-likelihood trees while for rates we utilized ordinary differential equations to model speciation events. The model assumes evolution as a continuous process and at each node the current number of species is proportional to the speciation rate thus the time elapsed between nodes drives the signal for speciation rate changes. Our empirical data shows that different taxon samplings affect phylogenetic reconstruction suggesting that to obtain a stable and accurate TOL sequencing efforts should be more evenly distributed across taxonomic categories.

Presenting Author: Mingyuan Tao

Inverse Livengood-Wu Integration Method for Analyzing Ignition Delay Times in Reactors with Varying Conditions

Livengood Wu integral technique involves de-convolving the constant condition ignition delay times from measured ignition delay times using information on the state history of the reactor. In this brief paper, the pseudo inverse problem, using known chemical mechanism and detailed modeling to estimate the temperature and pressure state history is demonstrated. Using the method, measurements of ignition delay times in systems like the miniature shock tube compare very favorably to those performed using more conventional techniques, such as regular shock tubes. The full method can be performed if simultaneous temperature measurement is available.

Presenting Author: Swathi Vadde

Effects of Fault on Loan Distribution with FIFO (First In, First Out) and LIFO (Last In, First Out) Methods

The purpose of this research is to obtain a closed form solution for the finish time, taking into consideration the adverse effect of the fault for both Single Installment and Multi-Installment with FIFO and LIFO result allocation. The System under consideration in this research is a system that utilizes for job scheduling a Divisible Load scheme that entails distributing arbitrarily divisible computational loads amongst eligible processors within a bus-based distributed computing environment, including the aspects of both Single Installment and Multi-Installment scheme of Divisible Load Theory along with the Results Collection Phase. Multi-Installment processing consists in sending multiple small chunks of the load to processors instead of a single chunk. In this distributed system, there is a primary processor, processors in addition to backup processor. Processors periodically checkpoint their results on the backup processor. If a processor fails, the backup takes over and rolls over to the time of the last check pointing. Assuming, one processor fault during a life time of Single task execution is only considered.

Presenting Author: Jennifer Vrabel

Pathological Personality Traits and Vices: Do Moral Concerns Mediate the Association?

Significance and Goals: Morality plays an important role in social interactions and has been shown to be associated with engaging in immoral thoughts and behaviors (i.e., vices; Jonason, Zeigler-Hill, & Okan, in press). Research has shown that some of the darker aspects of personality (e.g., narcissism, Machiavellianism, psychopathy) have unique associations with vices (e.g., Veselka, Giammarco, & Vernon, 2014), yet little is known about the associations between pathological personality traits and immoral thoughts and behaviors. The purpose of the present study was to examine the connections between pathological personality traits and immoral thoughts and behaviors. We predicted that individuals with high levels of pathological personality traits (e.g., antagonism) would be more likely to engage in the vices (e.g., greed) and that these associations would be mediated by moral concerns. **Method:** Participants were 1,139 undergraduate students. Participants completed measures of pathological personality traits (i.e., Personality Inventory for the DSM-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012), vices (i.e., Vices and Virtues Scales; Veselka, Giammarco, & Vernon, 2014), and moral concerns (i.e., Moral Foundations Questionnaire; Graham et al., 2011) via a secure website. **Findings:** The present study suggests that the relationship between pathological personality traits and immoral thoughts and behaviors can be explained, at least in part, by the moral foundations. Results revealed that certain pathological personality features (e.g., antagonism, disinhibition) were positively associated with vices (e.g., greed, anger, envy). A mediation analysis showed that individualizing values mediated the association between pathological personality traits and vices. For example, the associations between high levels of antagonism and the vices were explained by low levels of individualizing moral foundations. Taken together, this research expands our knowledge concerning the relationships between pathological personality traits, morality, and immoral thoughts and behaviors.

Presenting Author: Tong Wu
A Kinetic Modeling Study on Octane Rating and Fuel Sensitivity under HCCI Condition

With the development of advanced compression ignition engines such as the homogeneous charge compression ignition (HCCI) and the reactivity controlled compression ignition (RCCI), the long existing research and motor octane rating for fuels, i.e., RON and MON, might be insufficient to describe the fuel reactivity and performance with these new combustion strategies due to their distinctive engine operation conditions. It is also noted that with the stringent regulation for CO2 emission, fuel reactivity is urgently needed for the selection of novel alternative bio-fuels for transportation, and optimization of their engine performance in the future. Therefore, it is very intriguing to understand the reactivity and sensitivity for general class of fuels with the variation of operation conditions in these advanced combustion engines. In this study, we have simulated the performance of different class of fuels including hydrogen, alkanes (straight and branched), alcohols, aromatics and potential bio-fuels under typical HCCI engine conditions using validated detailed chemical kinetics. The crank angle corresponding to 50% total heat release (CA50) is utilized as an indicator for the fuel reactivity. The iso-contours of CA50 are then plotted in the engine operation parameter coordinate, such as the intake temperature, pressure and engine speed. It is shown that CA50 value can vary significantly with different engine operating conditions, and that fuels with the same RON/MON even exhibit qualitatively different CA50 iso-contours, implying the intrinsic reactivity of different class of fuels, as well as the insufficiency of RON/MON as octane rating standards. Besides, the operation regime with high and low sensitivity, as well as potential non-monotonic change in fuel reactivity have been identified by the gradient and tendency of these CA50 iso-contour map for all fuels.

Presenting Author: Meng Xu
Parameter Estimation for Li-Ion Batteries Multiphysics Modeling

A lithium ion battery can be designed as a power battery or an energy battery depending on the power and energy requirements when the battery is applied in plug-in hybrid electric vehicles (PHEV) and electric vehicles (EV). Design parameters of a battery cell usually play an important role in its power density and energy density. For instance, increasing the thickness of the porous electrode offers higher energy density for the battery cell with fixed geometrical dimensions. However, a thicker electrode tends to lengthen the path for lithium ions to diffuse in the electrolyte, which results in poor power capability. Some other parameters such as the particle size and porosity of the active materials in each electrode are also important to the electrochemical performance of a battery cell thus influencing the power density and energy density. The objective of this research is to optimize the battery design parameters to obtain the desired power density and energy density for the batteries used in PHEV and EV. A one-dimensional electrochemical isothermal model is developed by coupling the mass conservation, charge conservation, as well as electrochemical kinetics for a Li-ion cell. The one dimensional cell unit is assumed to be a sandwich structure that is composed of a negative electrode, a separator and a positive electrode. The electrodes are porous solid matrix that consists of active particles with spherical shapes of uniform sizes and additives. The separator is a porous polymer membrane that constitutes a physical barrier between the two electrodes. Both electrodes and separator porous matrix are impregnated with electrolyte ensuring the transfer of lithium ions between two electrodes during charge and discharge. The three coupled governing equations, including mass, charge conservation as well as Butler-Volmer equation, along with other constituent equations and proper boundary conditions, will be solved by COMSOL Multiphysics software. The cell properties, such as geometry parameters and electrochemical properties, are obtained from the cell manufacturer. The experimental data are provided by an industrial partner. The model validation is conducted by comparing simulation results with experimental data of discharging behaviors of different testing samples at various discharge rates. The parameters of interest include the thickness, porosity and particle size of electrode materials at a single cell level. For example, the electrode thickness study was conducted with the same porosity and the same particle size. It has been found that the cell discharge capacity faded more when the thickness of positive electrode increases from 45um to 70um at the same discharge rate (2C), which is consistent with the experimental results. Faster the cell is discharged, and more the discharge capacity fades. More results on the influence of porosity and particle size of electrode material on the cell performance will be reported in the conference. Based on the study of each single parameter, a multi-parameter optimization can be conducted to meet a specific design objective of both power density and energy density properties for cells applied on PHEV or EV. This research reveals the effects of design parameters of a Li-ion battery electrode on the battery energy density and power density, which are very useful for battery modeling and design.

Poster Presentations

Presenting Author: Jamilah Alhashidi
Stage of HIV at Diagnosis and Retention Rate in Care in an Expanded Testing Site

Introduction: In the absence of a cure for HIV, early diagnosing is still very important to help prevent complications and risk of transmission to others. When individuals do not receive treatment and are unaware of their HIV status, they can easily progress through three stages of acute infection, clinical latency and acquired immunodeficiency syndrome (AIDS). Examining the number and stage of patients being diagnosed would provide a better look as to how long it takes for patients to seek medical care and for physicians to diagnose. In addition to diagnosis, retention of care is essential in helping reduce complications from progression of HIV and even to halt the disease. This study aims to determine the stage of diagnosis at an expanded testing site in Detroit, and the retention rate of patients that are linked to care. **Methods:** This is a retrospective study, using data collected in the Emergency Department at Detroit Receiving Hospital from all patients who tested positive for HIV between January 2010 and March 2016. The data will be extracted from patients' electronic medical record, CTR forms, and Michigan Department of Health and Human Services (MDHHS) database of HIV positive individuals. **Anticipated Results:** Patients tested in the Emergency Department are expected to be in the clinical latency phase of HIV, most often at diagnosis, when compared to the other two phases. Additionally, although the linkage rates to care have been very high, the retention rates in care are expected to be lower. **Conclusion:** The results are expected to support the hypothesis that most patients seen in the Emergency Department are coming in for complaints not directly related to HIV and the findings from the rapid test are incidental, as patients are typically in the clinical latency phase when diagnosed. Additionally, Detroit Receiving Hospital serves an underserved population. This results in barriers to the continued access of care.

Presenting Author: Emad Alsyed
Multiscale Approach to the Bragg Peak Position of Proton

Since Robert Wilson suggested using the proton because of its good features of the shape of depth-dose distribution, the multiscale approach to the physics of radiation damage that resulted from using proton therapy has been developed. Charged projectile like proton has difference in the energy deposition profile compared with photons. Due to this difference, the Bragg peak, which is acute maximum in the dose deposition of proton, is completely different compared to the Bragg peak of photons. As a benefit of this feature, the Ion Beam Cancer Therapy (IBCT) allows to deliver a high dose to the tumors and in the same time, minimize the dose for healthy tissues (surrounding tissues). Due to the interaction of the projectiles with the molecules of the medium which increase to the maximum as the speed of the projectile decrease, The Bragg Peak occurs. As a result, within 1 mm of the ion's trajectory, the deposition of the destructive energy to the tissue per unit length of the ion's path is maximized. The location of the Bragg peak will be based on the initial energy of the projectile. Recent studies calculated the position of the Bragg peak by either analytical or using Monte Carlo simulations. However, there is a small gap between the calculation and experiments position. Making a further study of multiscale approach to the physics of radiation may play a crucial role in understanding the phenomenon of dose deposition of protons. Eventually, that may minimize the gap between the calculation and experiments position of the Bragg peak.

Presenting Author: Toritsetse Aniejurengho
Enhancing Awareness of Coronary Heart Disease (CHD) with Lifestyle Modification in Young Adult African American Women

Awareness and knowledge of coronary heart disease (CHD) risk factors are prerequisites for healthy lifestyle behaviors. According to the Center for Disease Control and prevention (CDC, 2016), CHD remains the leading cause of death among non-Hispanic African American women accounting for over 18,000 deaths in 2013. Mortality rates for AA women age 45-64 after a myocardial infarction (MI) surpasses that of black men with 10% of AA women who will die within a year following a MI and 28% of AA women within five years following a MI. CHD deaths among younger AA women ages 35 to 54 have increased with an average annual rate of 1.3% per year since 1997 (Capewell, Ford, Critchely, Greenlund, & Labarthe, 2010). Despite increased efforts to raise awareness among women little is known in regards to how younger women perceive their long-term risk for cardiovascular related illness or death or their level of knowledge for the prevention of CHD. Knowledge alone will not translate to a change in healthy lifestyle, but is arguably a necessary indicator of the process when implementing a change that impacts wellbeing. To identify investigations pertaining to CHD awareness and lifestyle modifications in young adult AA women, literature searches

were conducted in five databases: MEDLINE, CINAHL, Cardiosource Clinical Trials, Cochrane Library, and PsycINFO. Studies were restricted to those conducted in the United States and published between 2004 and 2016. Khare and associates (2012) revealed women with higher CHD knowledge levels were more likely to practice health promotion behaviors and measures that reduce risk of CHD and promote healthy lifestyle practice. The accurate assessment of women's CHD knowledge is an essential strategy to enhance lifestyle modification in women and reduce the prevalence of CHD.

Presenting Author: Farid Badar
Improve the Detection of Cartilage Degradation by Dividing the Tissue Unequally

Purpose: This study compared the consequences of different zone-divisions in MRI T2 of articular cartilage using an animal model of early osteoarthritis (OA). **Materials and Methods:** Six animals were the non-operated normal controls (Normal) and twelve animals underwent anterior cruciate ligament (ACL) transection on one of their knees (approved by IACUC). The operated animals were sacrificed 8 week and 12 weeks post-surgery (8wk-OA, 12wk-OA). The non-transected contralateral knees in these animals were also studied (8wk-C, 12wk-C). Within 24 hours of sacrifice, the intact knee joints were first imaged using a Varian 7T/20cm macro-MRI. T2 experiments were carried out using a multi-slice multi-echo (MSME) pulse sequence. The ten echo times were 10, 20, 30...100ms, with TR set at 3 seconds. The FOV was 5cm with a matrix size at 256 x 256. The imaging matrix was reconstructed in post-acquisition to 512 x 512 using Varian's Fourier reconstruction. **Results:** Two methods of image analysis were used in macro-MRI T2 data analysis: (1) an equal division of the entire cartilage from the surface to the cartilage-bone interface and (2) an unequal division of the same cartilage based on the knowledge from µMRI zones. With the equal division, significant difference can be detected statistically in Zone I between Normal and both OA groups; however, there were no statistical significance between Normal and Contralateral cartilage, or among any comparison in Zone II and Zone III. With the zonal knowledge from µMRI, the unequal division of the same T2 profiles from macro-MRI enabled the significant differences to be detected statistically in the superficial zone (SZ) between the Normal and OA, and between the Normal and Contralateral cartilage. **Conclusion:** In this study, we show statistical differences between the two image analysis methods in the detection of small changes in T2 due to OA progression.

Presenting Author: Anita Bajpai
Primary Health Disparities and Diseases among the U.S. Hispanic Population – A Growing Problem

Introduction: Hispanics represent the fastest growing minority population in the United States. This research identifies diseases with significant morbidity and mortality among the U.S. Hispanic population. It further explores disparities in prevalence of such diseases in comparison to the general population. Our aim is to increase awareness among the healthcare professionals so that targeted actions can be taken to alleviate the problems. **Method:** To maintain contemporaneous relevance, mainly studies conducted within the last five years are included. Population and segmentation data are taken from authoritative sources such as U.S. Census Bureau in conjunction with healthcare data from Centers for Disease Control (CDC) and National Institutes of Health (NIH). **Findings:** We are finding higher prevalence of chronic diseases like diabetes mellitus (DM) and hypertension (HTN), cardiovascular disease (CVD) sequelae to chronic conditions, with increased morbidity. Occurrence of chronic kidney disease (CKD) leading to end-stage renal disease or kidney failure is disproportionately high. HIV-AIDS is less prevalent but surprisingly, Hispanic Americans die from it at a rate nearly three times higher than the general population. This disparity appears to be rooted in delayed diagnosis attributable to lack of healthcare access as well as cultural norms that stigmatize the disease. **Relevance:** This research provides a holistic perspective that spans several diseases and can help address principal root causes thereby mitigating the incidence of an array of diseases that afflict Hispanic Americans disproportionately. The findings are timely and relevant in the context of ongoing national debate surrounding the Affordable Care Act.

Presenting Author: Syeda Batool
Strain- and Depth-Dependent Poisson's Ratio in Articular Cartilage

Articular cartilage functions as a load bearing material in joints. Compression of cartilage changes its complex bio mechanical environment, which are depth-dependent. Chondron are the mechanical unit of living cells in cartilage, consisting of hondrocytes and its pericellular structure. We aim to measure the compressive modulus and Poisson's ratio of the chondrons in situ. Full–depth osteochondral slices with a thickness of 120±5µm were prepared from the center region of canine humeral heads. A home-made glass fluid chamber, which sandwiched the cartilage slice, was placed under a Nikon microscope. Step wise unconfined stress relaxation tests were performed in situ using compression step of 30µm at 5µm/s under computer control. At the end of each relaxation, an image (pixel size of 0.435µm) was captured, where the cellular deformation was analyzed. The preliminary results reveal that both

compressive modulus and Poisson's ratio increase for all depth region at all individual strains. Within five strain increments (max 25%), the strain-dependent Poisson's ratio increases from superficial zone to transitional zone and then decreases from transitional zone to radial zone. Our preliminary observation of the negative Poisson's ratios of some chondrons in transitional zone has never been reported before, which could result in enhanced toughness even if the material is compliant. Whether the orientation of collagen fibrils is responsible for auxetic behavior of chondron is an open question. Further studies will determine the relationship between mechanical response of cartilage and its cellular composition, in both healthy and osteoarthritic tissues. We thank NIH for their support.

Presenting Author: Sarah Berry
Development of a Middle Range Theory: Predicting Fall Risk in the Older Adult

Falls are the leading cause of injury related mortality among older adults (age 65 and older) (Hatamabadi, et al., 2015; Liu, et al., 2015; Milne, et al., 2015; Carpenter, et al., 2014). The risk factors for falls as well as the devastating consequences have been well documented in literature (Liu, et al., 2015; Carpenter, et al., 2014; Stevens, et al., 2006). Fall risk was selected as the concept for the development of this middle range theory because of its significance in health care, specifically, in the discipline of nursing. Fall risk is one of the North American Nursing Diagnosis Association (NANDA) diagnoses and is commonly assessed by nurses in all acute care patients. A middle-range theory (MRT) is a theory that focuses on only a piece of reality or human experience, which involves a number of selected concepts. The MRT is often substructed from a grand, broader theory. For purposes of this analysis, the grand theory used was Rogers' Theory of Unitary Human Beings. The concept analysis and substruction was conducted using the method described by Walker & Avant (2011). The concepts of Rogers' theory are directly derived to the MRT, using the substruction model to provide linkages. To evaluate the theory, empirical referents used for fall risk measure the person's ability to maintain gait and/or balance which would either increase or decrease the chance of falling. The goal of this analysis is to determine an operational definition for the concept of fall risk that can be used to better predict fall risk in the elderly population.

Presenting Author: Kunal Bhatia
CareTainment – Research & Development Prototype

Project CareTainment is a collaborative research and development project under guidance of Dr. Mohan Tanniru, Oakland University School of Business & Old Persons Commission (OPC) community at Rochester Hills. Its research is based on how current technology space can help empower seniors to take better care of themselves in various aspects of their daily life including medication reminders, physical support and social/entertainment help. CareTainment also completed its development related goals & thus built a proof of concept/prototype to demonstrate potential solutions viability to address needs and challenges that the research aspect reports on. Prototype was demonstrated on November 2015 at the Old Persons Commission (OPC) center, at Rochester Hills, Michigan and received plenty of response and written feedback. Feedback data is compiled and provided within the report.

Presenting Author: Johnnie Blunt
The Impact of an Authentic learning Site on Pre-Service Teacher Self-Efficacy

Understanding what aspects of teacher preparation improve teachers' self-efficacy is critical because greater self-efficacy improves teacher retention. Many teachers leave the profession within the first 5 years of their careers because they do not feel confident in the teaching abilities. While studies address how several aspects of teacher preparation are related to self-efficacy, few examine the impact of authentic learning sites, such as situating teachers' learning in partnership schools, on students' teaching self-efficacy. We addressed this issue, as part of a larger mixed-methods research project, in the hopes of contributing to the field's knowledge about how authentic learning sites used for teacher preparation are related to pre-service teachers' self-efficacy. Our research question was, "How do pre-service teachers' articulations of their experience in a service-learning course map onto Bandura's self-efficacy theory across 4 levels: mastery experience, vicarious experience, verbal persuasion, physiological and psychological states. Researchers interviewed 34 teacher education students at the end of the service-learning course. The interviewers asked students to rate their self-efficacy across multiple areas (e.g., specific literacy teaching methods) on a Likert scale. A semi-structured interview followed to provide pre-service teachers an opportunity to articulate a rationale for each of their ratings. We used each teacher response to a specific survey and interview question as the unit of analysis. Then, we used emergent coding and constant comparative methods to identify eight codes that were aligned with teachers' higher ratings of self-efficacy (e.g., authentic learning context). These were than mapped into Bandura's four hierarchical levels of self-efficacy (e.g., mastery experience). Analysis revealed that most codes mapped onto the highest levels of Bandura's self-efficacy theory. Based on these findings, engaging in methods classes at a partnership site may be one way for teacher preparation programs to increase their students' self-efficacy.

Presenting Author: Lori Boright

The Effect of a Multimodal Prehabilitation Program for Individuals Diagnosed with Head and Neck Cancer: A Narrative Review

Background: Head and neck cancers account for 3% of total cancers diagnosed. Quality of life implications are severe for this patient population due to facial deformities and decreased oral motor function resultant of treatment intervention. Complications of treatment that meet criteria for rehabilitation include diminished cardiorespiratory fitness, reduced scapular strength and cervical range of motion. There exists a significant lack of evidence regarding prehabilitation for the purpose of mitigating these complications in patients diagnosed with head and neck cancer. Evidence is abundant regarding positive outcomes for prehabilitated patients who undergo some orthopedic procedures setting a precedent for this patient population. Methods: An exhaustive search was completed including the databases - PubMed, EMBase, Chocrane Library, Web of Science, Scopus, and Google Scholar. The search terms utilized were: Cancer AND Prehabilitation, with MeSH term neoplasm. Results: 100 articles were obtained. Duplicates (31), abstracts and posters (7), and studies that investigated non-oncology populations and/or didn't include exercise elements in the prehabilitation study (26) were removed. A total of 38 articles remained. Only one publication regarding prehabilitation for patients diagnosed with head and neck cancer was identified while the remainder focused on various other cancer diagnoses. Limitations: Only five databases were searched. Conclusion: There is a significant paucity of evidence available for this topic. The evidence that does exist is difficult to compare and contrast relative to inconsistencies in recommended frequency, duration and mode of treatment delivery. More research is needed to determine importance of prehabilitation as the gateway to the cancer survivorship continuum.

Presenting Author: Samantha Brindley

Outgroup Member's Internal Criticism Promotes Intergroup Openness: The Role of Perceived Risk

Recent research has provided evidence that hearing an outgroup member voice internal criticism increases individuals' hope about future intergroup relations, and as a result, their openness to the outgroup's perspective. Here we focused on the mechanism that underlies this effect, positing that the risk involved in voicing internal criticism of one's ingroup is crucial to its effectiveness. Two studies assessed different cultural contexts, the Black-White racial tensions in the United States (Study 1) and the Israeli-Palestinian conflict (Study 2) through online survey formats. Study 1 found White participants exposed to a Black community leader voicing internal criticism perceived the speaker to be more open-minded leading to increase hope about future relations, and as a result participants were more open to the Black perspective. Study 2 extended these findings in the context of Israeli-Palestinian context to include that Israeli participants when exposed to a Palestinian leader voicing internal criticism perceived the outgroup as more open-minded, felt more hopeful about future relations, and reported more openness to the Palestinian narrative of the conflict, but only if the participants perceived that the speaker took a risk voicing his perspective. These findings add to a promising foundation of research on the role that internal criticism can play in fostering intergroup openness.

Presenting Author: Jacquelyn Cameron

Occipital Neurolysis and Resection for Treatment of Occipital Neuralgia

Introduction: The posterior scalp receives sensory innervation from the greater occipital nerve, with additional sensation provided by the lesser occipital nerves. Irritation to these nerves due to inflammation or trauma can result in a sensation of pain, referred to as occipital neuralgia. Although it is felt to be relatively rare in clinical practice, the pain patients with occipital neuralgia suffer from can be debilitating. There are currently no formal guidelines for treatment of occipital neuralgia. The goal of this study is to determine if occipital nerve neurolysis, in which the entire occipital nerve is surgically removed, is statistically superior to other treatment modalities in regards to pain relief and incidence of recurrence. By doing so, we hope to standardize the care of patients with occipital neuralgia. **Methods:** Retrospective chart review was performed on 30 patients with data compiled to compare levels of reported pain and non-pain symptoms at pre-operative versus post-operative visits for patients who underwent greater and/or lesser occipital nerve neurolysis. Pain and non-pain symptoms were scored using the Chicago Chiari Outcome Scale (CCOS) modified for occipital neuralgia. Patients receive a score of (1) if their reported symptom is worse compared to preoperatively, (2) the same, (3) improved and (4) if the symptom has completely resolved since surgery. The primary aim of this analysis is to compare the one-year success rate of treatment with occipital nerve neurolysis to published success rates using a one group Chi-Square test. **Anticipated Results:** For cases of medically refractory occipital neuralgia, we propose surgical neurolysis is the best treatment option. Specifically, we believe our study will show that patients undergoing neurolysis will demonstrate greater pain relief with a lower recurrence rate when compared to other treatment modalities. **Conclusion:** The results are expected to support the hypothesis that surgical neurolysis results in greater pain relief and decreased frequency of pain recurrence when compared to other treatment options.

Presenting Author: Jewel Cannon
Texting Behaviors and Attachment Styles in Intimate Relationships

Abstract: This project reviews the potential impact of attachment styles of those in relationships and how their attachment style affects their texting behaviors and frequency. Generally, it has been shown that texting plays a role in relationships; this project goes further by exploring whether attachment styles to explain those individual texting behaviors. Three hypothesis regarding attachment style, texting behaviors and relational satisfaction are proposed. **Purpose:** To study the relationship between texting frequency, relational satisfaction and attachment styles. H1: Those with an avoidant style attachment are likely to have a higher text frequency than those with an anxious style attachment, which are likely to have more frequent texts than those with a secure attachment style, who should have the lowest texting frequency. H2: For people with secure attachment styles, there is a negative correlation between the frequency of texting and relational satisfaction. H3: For people with avoidant attachment styles there is a positive correlation between the frequency of texting and relational satisfaction. **Methods:** Approximately 200 university students, in a committed relationship of at least 3 months, who are at least 18 years old, would be recruited to participate in our survey. **Procedure:** Administration of paper copies of the survey during class periods, with instructor permission to qualifying students.

Presenting Author: David Chu
The Effect of Acupuncture Therapy on Gastrointestinal Symptoms of Patients Seen in Integrative Medicine

Introduction: Acupuncture is a traditional therapeutic modality, which has developed into an effective alternative treatment option for various disorders. Though studies have demonstrated the association between acupuncture and improved chronic pain outcomes, little has been done to demonstrate acupuncture's effect on common gastrointestinal (GI) disorders. In addition, some medications that are frequently used to manage GI issues are not only expensive but also have severe side effects. Therefore, the establishment of alternative, less invasive treatments, such as acupuncture, would significantly benefit the management of GI symptoms. This study seeks to explore the immediate and long-term therapeutic effect of acupuncture on patients seen in the integrative medicine department for GI symptoms. **Methods:** Using a survey-based approach, patients were asked for data such as chief complaints, medications, diagnoses, GI symptoms, severity of symptoms, overall well-being, emotional/mental status, and stress levels. Acupuncture visits are categorized into 3 groups: visits 1-3 (group A), 5-7 (group B), and 9+ (group C). Statistical analysis using ANOVA (Analysis of Variance) will examine different groups of patients at various stages of their acupuncture treatment, to determine the long-term effect of acupuncture on GI symptoms. **Anticipated Results:** Data is anticipated to demonstrate statistically significant (p-value ≤ 0.05) self-reported improvements in the following areas: severity of symptoms, percentage of improvement in overall GI symptoms since first acupuncture session, overall well-being, and stress levels. Improvements between groups A and C are anticipated to be more statistically significant than improvements between groups A and B or groups B and C. **Conclusion:** The results are expected to demonstrate the positive short- and long-term therapeutic effects of acupuncture on GI symptoms. These findings may lead to the establishment of acupuncture as an effective complementary or alternative treatment option for common GI disorders, which may alleviate some of the severe side effects of traditional medications.

Presenting Author: TaSondra Foltz
The Effectiveness of a Nurse Suicide Screening Tool for Veterans in the General Medicine and Surgical Patient Population

Nurses have the potential to detect and prevent suicidal ideation and suicide attempts in all settings. Effective screening for suicide of Veterans on general medicine and surgical units using a nursing suicide screening tool has the potential to detect the risk for suicide in non-psychiatric patients while also identifying influencing factors. The purpose of this retrospective pilot research study is to determine the effectiveness of a brief modified suicide screening tool for nurses to use during their usual nursing assessment to identify patients at risk for suicide on medical and surgical inpatient hospital units. The sample consists of 47 charts of military veterans admitted to inpatient medical and surgical units at a VA Medical Center in South East Michigan. Data was collected for patient demographic information, current medication, medical history (past and present), and mental health history (past and present) and positive suicide screens. The findings of the study indicated that there were no positive screens found in patients given the Brief Suicide Screening Tool (BSST). It is possible that the low number of suicide screens and limited subject variability influenced this pilot study's finding as the majority of patients were African American Males over the age of 65.

Presenting Author: Lauren Foster
Comparison of Hypo-Fractionated Breast Radiation with Boost to Conventional Radiation with Boost

Introduction: Whole breast radiation represents the standard of care in adjuvant radiation therapy in the setting of breast conservation for early-stage breast cancer. The conventional fractionation schedule delivers 50 Gy in 25 fractions. However, hypo-fractionated treatment schedules are preferred when possible. Hypo-fractionated radiotherapy shortens total treatment time, enhances convenience, and lowers costs for the patient and the institution, while providing equivalent treatment outcomes. Adding a dose boost of radiation to the lumpectomy cavity can confer additional tumor control for patients with risk factors for local recurrence. Currently, there are limited data comparing the use of a boost in hypo-fractionated treatment vs conventional treatment schedules. **Methods:** This study will examine patients treated with adjuvant whole breast radiation using either hypo-fractionated or conventional radiation therapy with a boost at Beaumont Health System between 2008 and 2016. A retrospective chart review was done to compile data including patient and treatment characteristics, toxicity data, and clinical outcomes. A match pair analysis will be performed matching patients by age, stage, tumor grade, margin status, and estrogen receptor status. Analysis will be performed to determine clinical outcomes and acute and chronic toxicity. Clinical outcomes will include local recurrence, regional recurrence, distant metastases, breast cancer-specific survival, and overall survival. Toxicities will be graded using the NCI Common Toxicity for Adverse Events v.3.0, and the cosmetic evaluation was scored using the Harvard Criteria. **Anticipated Results:** Compared to the conventional fractionation with boost, the cohort of patients receiving a hypo-fractionated radiation schedule with subsequent boost is expected to have similar clinical outcomes, acute, and chronic toxicity. **Conclusion:** Assuming that both treatment schedules offer comparable outcomes, hypo-fractionated therapy should be the preferred method of treatment for appropriately selected women with early-stage breast cancer receiving adjuvant radiation therapy.

Presenting Author: Devon Freudenberger
Sports-Related Concussion Knowledge and Attitudes of Intramural and Club Sport Athletes

Sports-related concussions have garnered greater public health concern as their incidence rises, leading to changes in concussion education and laws aimed at protecting athletes. Currently, the intramural and club sport programs sponsored by the Recreation Center at Oakland University do not have a concussion education program for athletes to complete. Therefore, it is desired to determine the extent of knowledge and types of attitudes these athletes have towards concussions, and if these characteristics vary between intramural and club sport athletes. We hypothesize that due to the lack of a concussion education program the athletes do not possess adequate knowledge and thus harbor unhealthy attitudes towards concussions. A validated and reliable concussion knowledge and attitudes survey was modified and sent to intramural and club sport athletes at Oakland University's Recreation Center. 182 of 200 respondents had complete survey data, of which 54% were female and 46% male; 60% participated in intramural sports only, 26% in club sports only, and 14% in both. Preliminary results indicate an average overall knowledge score of 20/25 (80%) and attitude score of 60/75 (80%), with higher scores indicating higher levels of knowledge and healthier attitudes. These scores did not vary by type of sport participation. Further results and statistical analysis are forthcoming. The results are expected to provide insight into the knowledge and attitudes of intramural and club sport athletes towards concussions, and to provide recommendations to the Oakland University Recreation Center about whether there is a need for implementing a concussion education program for its athletes, as well as the content areas of focus for such a program.

Presenting Author: George Fu
A Pilot Study to Investigate the Neuropsychological Effects of Binaural Beats on the Human Brain

Introduction: When two auditory stimuli of slightly different frequency are presented separately to each ear, the listener perceives a fluctuation termed binaural beats. The beat frequency is equal to the difference between the frequencies applied to each ear. We hypothesize that binaural beats of a specific frequency may be applied to a listener to excite brainwaves of the same frequency, thereby inducing the associated state of mind. We will gather preliminary data on the neuropsychologic effects of binaural beats at two brainwave frequencies. **Methods:** This pilot study is a randomized, blinded, placebo-controlled crossover experiment in 4-8 healthy adults. Subjects participate in three sessions; during each one they are randomized to an experimental auditory stimulus consisting of 30 minutes of binaural beats at 8Hz, 30Hz, and 0Hz (control) with an overlay of pink noise resembling the sound of rain. Data will be collected at three separate sessions each held within three weeks of the previous one. Neuropsychologic data will be collected before and after the intervention; subjects will also be offered the chance to submit subjective comments on effects they felt from listening. Neuropsychologic measures include Trail Making Test, Stroop Test, Creativity Assessments, Auditory and Visual Learning Test, Word Association Test, State Mood Questionnaire, Anxiety Questionnaire, and Big Five Personality Inventory. All measures will be analyzed for

differences before and after listening to binaural beat stimuli. **Anticipated Results:** Compared to the control, treatment with binaural beat stimuli is expected to result in a difference in neuropsychological function in the same participant group. We also expect differences in the effects on neuropsychological function between the two binaural beat treatments. **Conclusion:** The results are expected to support the hypothesis that stimulation with binaural beats at a particular frequency will excite brainwaves of the same frequency. This will present as a difference in neuropsychological function.

Presenting Author: Lisa Galasso
Evaluation and Management of Large Rheumatoid Nodules

A 59-year-old female with a past medical history of rheumatoid arthritis (RA) presented with several year history of bilateral, painful elbow masses resulting in difficulty with activities of daily living (ADL). The right olecranon bursa had been aspirated in the past in attempt to reduce its size with little success. At the time of evaluation of the right elbow, there was no sign of infection and the surrounding skin was intact. Radiographs of the right elbow demonstrated normal bony architecture with evidence of a soft tissue density in the area of the olecranon bursa. Based on the patient's past medical history, it was concluded that these nodules were most likely a manifestation of her RA. Surgical excision was warranted due to failed conservative treatment of the symptomatic nodule. Options for treatment, plus risks and benefits were explained to the patient. Diagnostic and therapeutic removal of the right elbow mass was felt to be appropriate. The patient was agreeable to surgical excision and tolerated the procedure well without complications. Post-operative pathology revealed the excised right olecranon bursa measuring 6.1 x 4.0 x 4.9 cm contained soft tissue with necrobiotic granulomas, chronic inflammation, and reactive and hyperplastic synovium consistent with RA. The smaller and more distal mass measuring 2.4 x 1.9 x 1.5 cm was examined and showed similar soft tissue characteristics, also consistent with RA. Indications for surgical excision of this patient's rheumatoid nodules were primarily due to interference with her ADLs, such as doing desk work and dressing, as well as cosmetic appearance. There is a gap in the literature which addresses surgical indications and outcomes for excision of RA nodules. There is some concern voiced in the literature for possible reoccurrence of RA nodules. There was no evidence of reoccurrence of the nodules at 18-month post-operative follow-up. Based on the outcomes of this case, surgical excision is warranted when patients have failed and are unsatisfied with conservative treatment.

Presenting Author: Rafaella Genova
The Use of Rigid External Distraction (RED) Device in the Management of Acute Comminuted Maxillofacial Fractures

Introduction: Maxillofacial fractures elicit an array of functional and aesthetic issues. Distraction Osteogenesis (DO) has become the mainstay treatment of congenital craniofacial disorders. Recently, there have been a few cases describing the use of DO techniques in the management of old maxillofacial fractures. Here we demonstrate our use of a Rigid External Distractor (RED system; KLS Martin L.P., Tuttlingen, Germany) device in the management of acute midface trauma. **Case description:** A 27 year old female involved in an MVA sustained extensive mandible and maxillary fractures. She underwent ORIF and external fixation of the mandible. The maxilla was noted to be severely comminuted with no rigid areas to provide fixation. At this time, we decided to use a RED device to maintain maxillary projection and prevent collapse. Titanium mesh was fixated to the hard palate and the halo frame was secured above both ears. The mesh was connected directly to the distractor device. Following the operation, the midface was distracted 1 mm per day for 5 days, for a total distraction of 5 mm. The RED device was removed at 6 weeks and the mandibular external fixator was removed at 3 months. **Results:** As seen with our patient, the premaxilla and maxilla have maintained excellent projection at 1 year follow up. She has not had any significant relapse. Recently, she has undergone a free radial osteo-cutaneous sensate flap to add height to her mandible and to reconstruct her oral vestibule. **Conclusion:** To date there have been a few reports of the use of DO in the management of old maxillofacial trauma. We believe that external distraction devices have a role in the management of selected acute comminuted maxillofacial fractures.

Presenting Author: Benjamin Ghiam
The Dialogical-Narrative Approach

Purpose: The Dialogical Narrative (DN) approach is an interactive teaching method designed to teach physiology to medical students. It integrates an interactive conversational style within a narrative design. The dialogue is conducted between the teacher and students in a question-answer format that encourages active learning and builds an educationally safe and supportive environment that promotes relationship- centered learning. The lecture is narrative as the teaching tells the story of a physiological subject. It is hypothesized that the DN approach will increase students' engagement and active participation during lecture while enhancing students' critical thinking.

Methods: A week before the lecture, students were provided with PowerPoint slides, and encouraged to review the material. During the lecture, the instructor guided the students through the material using story- telling and question-answer conversational styles. Focus group sessions were then conducted in order to determine the students' perceptions of the effectiveness of the approach. **Results:** A lecture on thyroid physiology, implementing the DN approach, was given to second year medical students. Two focus groups, each consisting of seven medical students, were conducted following the DN lecture. Sessions were recorded and analyzed for student-perceived effectiveness and qualitative- thematic analysis was performed on the recordings. Analysis has revealed that: (1) the majority of students found the approach more engaging and conducive to active participation than traditional didactic lectures. (2) Although there is a divide among students who feel comfortable with active and open dialogue in front of the class, most believe these interactions foster skills that are essential for their success. **Conclusion:** Compared to traditional didactic lectures, most students revealed positive attitudes toward the DN approach. During the interactions, shared between the instructor and the students, many students found themselves thinking more critically of the subject matter due to the possibility of engaging in further dialogue with the instructor.

Presenting Author: Montana Green
Determining the Effects of Facilitated Ethics Discussion Sessions on Moral Distress Levels in Progressive Care Nurses: A Pilot Study

Moral distress is a reality faced by nurses with a significant impact on clinical practice. Moral distress occurs when a nurse is unable to do what he/she believes is the right ethical course of action. It is important to identify ways to support nurses experiencing moral distress because unresolved moral distress can have a negative impact on nurses, patients, and the care environment. In the literature, there are very few evidence-based interventions for reducing or preventing moral distress in nursing staff. This pilot study, currently in progress, will evaluate the effectiveness of participation in facilitated ethics discussion sessions on improving moral distress levels among nurses working on a progressive care unit. The discussion sessions were facilitated by the Director of Clinical Ethics for the chosen organization. All 80 nurses employed on the unit were invited to participate in the discussion sessions; a total of N = 12 nurses participated and completed surveys. Participants completed a pre- and post-survey rating their level of moral distress and provided feedback about their experience in the discussion sessions. Data collection was completed in October, November, and December of 2016 and the data is currently being analyzed.

Presenting Author: Ankita Guha
System and Method for Automating Patent Analysis

Patent Analysis is a tedious work. Companies often compete to get their Patents filed which in turn could make their exclusive rights over the technology domain and thereby gaining and maintaining their competitive industry position. With time, inventions took place in a pace often outgrowing technologies. Therefore, companies now are vying with one another to get Patents in the intersection of the technologies and are scrutinizing the gap to find a suitable fit for their inventions. Once they become successful in understanding the gap, Companies try to exploit that technical domain gap to either file a Patent or institute a legal battle with a prospective infringer. Hence, the need of Patent Analysis. Patent Analysts usually analyze a bunch of Patents depending upon the requirements laid out by the Company. These requirements hover not only around the technology but also upon the Filling or Grant Date and Legal Status that can explicitly indicate if the Patent is still enforced or if it's in the Public Domain. There are many databases that provide all the data required for conducting such relevant search to get Patents but still it requires human intervention to decode each Patent individually at a discrete level to exploit the technical gap. No matter how well informed one is with the technology, it takes time, understanding the background of the invention, comprehending the claims of the invention and how one invention which despite its apparent similarity could be substantially different from its apparently almost similar prior art. Therefore, automating the need of analyzing individual patents, feeding the whole data chunk with some technical feeds would prevent the inhuman amount of time, energy, and expenditure for analyzing each Patent at a discrete level. Apart from reducing the time required to analyze, this process would also ensure Companies to realize and reinforce business strategy irrespective of their different business processes.

Presenting Author: Katherine Hebert
Aerobic Exercise Training Effects on Resting Vital Signs in African American and Caucasian Women Following Breast Cancer Treatment: A Pilot Study

Breast cancer treatments elevate cardiovascular disease (CVD) risk by reducing cardiac efficiency (CE). Reduced CE is seen with increases in resting heart rate (RHR) and resting systolic (SBP) and diastolic blood pressure (DBP) measures. Aerobic exercise (AE) improves CE by reducing RHR, SBP and DBP, but this has not been examined among women during breast cancer treatment. Therefore, this study determined whether AE reduced vital signs

measures among women undergoing breast cancer treatment compared with a control group. The study also examined whether AE training adaptations differed based on ethnicity or the cancer treatment regimen. Twenty sedentary women [11 African Americans (AA) and 9 Caucasian (CC)] were randomly assigned to exercise (n=13) or control groups (n=7). Thirteen subjects received surgery plus chemotherapy and radiation (SCR) and 7 received surgery plus radiation (SR). Exercise was performed 7-8 weeks during radiation treatment. Resting vital signs were taken one week before and after treatment. Maximal oxygen consumption (VO2 max) was measured to confirm training occurred. Following training, VO2 max increased 7.8% for AE and declined 5.2% for control group confirming adaptations occurred from exercise. Overall, no significant differences were found in vital signs between the exercise and control groups. After treatment, AA had significant increases in RHR (15 BPM) while CC's RHR was unchanged. In contrast, CC had increases in SBP and DBP (8.0 and 4.4 mmHg) but AA's measures were unchanged. SCR treatment resulted in increased RHR (6.4 BPM) compared to SR but SBP and DBP remained unchanged. Increases in vital signs following treatment reduced CE and contributed to increased CVD risk. CE declines were greater among AA due to significant increases in RHR. The RHR was also higher among women who received SCR compared to SR alone. Study results support the need for cardiovascular screening in this population.

Presenting Author: Derrick Huang
Effects of Streamlining Consultation and Maintaining Hospital Bed Availability on Trauma Admission

Introduction: The proposal seeks to retrospectively analyze if quality improvements, which streamlined physician consult placement and reserved two hospital beds in the clinical decision unit (CDU), effectively reduced components of Length of Stay (LOS) time for CDU trauma patients in the emergency room (ER) at Beaumont Hospital Troy. This study seeks to find an effective and simple means to reduce the average LOS time for trauma patients at Beaumont Troy. **Methods:** Data was retrospectively gathered from 907 patients from January 2015 to June 2016. There were four time points collected: Arrival to Emergency Center (EC), Consultation, Admit Decision, and Departure from EC. Total LOS time is defined as: time from "Arrival to EC" to "Departure from EC." The bed placement intervention affects the time from "Admit Decision" to "Departure from EC," whereas the communications intervention affects the time from "Arrival to EC" to "Consult Placed." The communications intervention will be compared between January 2015 to June 2015 (pre-intervention) and July 2015 to June 2016 (post-intervention) while the bed intervention will be compared between January 2015 to October 2015 (pre-intervention) and November 2015 to June 2016 (post-intervention). Multivariate linear regression analysis compares the differences between pre and post intervention groups, adjusting for patient population demographics. **Results:** Before the communication intervention, the adjusted average Arrival to Consultation Time was 109 minutes, which decreased to an adjusted average of 76 minutes following the intervention (P-Value = 0.0015). Before the bed intervention, the adjusted average Admit Decision to Departure Time was 148 minutes, which decreased to an adjusted average of 79 minutes following the intervention (P-Value = < 0.0001). **Conclusion:** The results support the hypothesis that both the communications streamlining and additional bed placement have independent effects on reducing LOS times for CDU trauma patients in the ER at Beaumont Troy.

Presenting Author: Nicholas Ingarra
Thermal Osmosis in Fuel Cells

A fuel cell is an electrochemical device which converts the chemical energy into electricity and water. NASA originally used Proton Exchange Membrane (PEM) fuel cells in the 90's for the Gemini Mission. However, the water management problems of PEM fuel cells, NASA was forced back to alkaline fuel cells (AFC). To resolve water management issues in fuel cells, one must understand the water transport mechanism in the membrane. Water is transported thru the membrane through electro-osmosis drag, back diffusion, and thermal osmosis. Thermal Osmosis is fluid flow resulting from a temperature gradient across a porous media. The hydrogen ions use Electric Osmotic Drag (EOD) to move across the membrane. The membrane also allows the water generated to diffuse back toward the anode. The humidity of the porous media must be maintained to reduce the Ohmic resistance of the fuel cell. On the cathode side of the fuel cell, water is generated. The water generated on the cathode side is proportional to the current density. When water concentration on the cathode side is too high, the fuel cells flood and will shut down. Current fuel cell models focus on modelling EOD (Electric Osmotic Drag) and back diffusion in the membrane. Thus, thermal osmosis effects are ignored. The effects of the fluid flow can be from hot to cold, or cold to hot. Current Thermal Osmosis model can predict the magnitude of the flow, and are required to predict both the magnitude and direction but, the models do not predict direction of water flow. The effect of thermal Osmosis needs to be added to fuel cell models to improve heat and water management in fuel cells. The thermal osmosis research involves examining the Dufour and Soret effects

Presenting Author: Jean-Pierre Iskandar
HistoConnect: An Online Integrated Module

Background: Educators in various fields, in particular medical schools, are relying on technology, advanced software and resources more than ever before. Online modules are occupying important places in the learning process as they complement live lectures in students' learning. They can also be very beneficial when it comes to the USMLE 1 preparation if utilized well, as they encompass many advantages such as virtual accessibility and pace control. **Aims:** Hereby we proposed to create online comprehensive integrated organ system modules targeting medical students that correlate to each organ system block in their curriculum for studies and reviews. **Methodology:** Histology-histopathology constituted the backbone of each module where images of both normal and abnormal tissues, in various disease states, were compared and discussed, thus, shedding light on disease process and related pathophysiology. Each module included pre- and post-tests, instructor's narrative, labeled microscopic images, links to virtual images, interactive activities, examples of related diseases, photo album, clinical correlations, definitions, cases to foster critical thinking, a Score Center to collect responses and a student evaluation. The outcome was assessed through various parameters such as surveys and pre/post quizzes covering knowledge, skills, attitudes, and professionalism, in addition to a timely feedback. **Results:** The modules were well received by students as a mean to identify gaps and make participation more flexible while taking into consideration the demands and pace of the student. Modules can also be easily revised and re-published by the instructor. **Conclusion:** These integrated modules based on structural biology, normal and pathological, will offer a better geography for understanding and achieve a high level of critical thinking and in depth understanding of the school curriculum.

Presenting Author: Sarah Jahimiak
The Effects of a Structured Art Group Experience on Wellness Levels of University Students

Although art therapy has been used for over 100 years as an adjunctive treatment method for physical and mental health disorders, the research findings regarding the efficacy of this approach have been mixed and inconclusive. Reviews of the current literature on the efficacy of art therapy have noted the field lacks well-controlled studies. Persistent issues in the literature have been (1) a lack of standardization and detailed methodological description regarding the intervention procedures, (2) confounding other treatment interventions with art therapy, and (3) small sample sizes. The present study sought to provide a well-controlled art intervention to test its effectiveness in enhancing wellness. This study involved a 4-week intervention group using a two-tiered control group in a pre-and post-survey with undergraduate students. The Five Factor Wellness (FFWEL) inventory was used as the measure of wellness levels and results were analyzed using Hierarchical Linear Modeling. This study demonstrated participation in a structured art group yielded significant change compared to no intervention, but not more significant change than participating in a wellness curriculum. The mixed findings are consistent with the current literature. The findings will be discussed in the context of each of the tested wellness factors. Implications for the findings, limitations, and suggestions for future research will be discussed.

Presenting Author: Jonathon Juszkiewicz
Improving Convective Boundary Condition Prediction for Long Transient Thermal Simulation through the Use of Response Surfaces

Over the past decade, vehicle OEM's have increasingly relied on 3D conjugate heat transfer (CHT) simulations to develop heat protection strategies for sensitive components such as plastic hardware or electronics. These simulations have historically been completed under the assumption of steady state conditions. This assumption has been used very effectively but, limits designers to simulating operating conditions that are seldom found in realistic applications. There has recently been a push to move from steady state simulations to transient simulations that more accurately represent end-customer use cases. The difficulty with this endeavor is the computational cost associated with transient CHT simulations. In the past few years, several researchers have demonstrated that decoupling the structural and fluid domains can be used to circumvent the limitations of these simulations. These researchers were able to demonstrate that mapping steady state CHT convective boundary conditions to a transient thermal simulation, then interpolating between the steady state boundary conditions allowed them to simulate component temperatures under highly dynamic long transient operating conditions. These methods offer a high degree of accuracy without unacceptably long run times or high computational resource usage. The goal of this research is to attempt to combine two of the most promising approaches to this type of transient simulation methodology, in particular, combining the data point selection methodology used by Haehndel with the interpolation methods used by Kaushik and Pryor. The end goal is to reduce the number of steady state CHT simulations required to generate a reusable response surface that accurately represents a wide range of transient boundary conditions to be used with a series of transient thermal models. This presentation will provide an overview of the current approaches, outline the proposed methodology and present preliminary results obtained from studies completed on simplified geometry.

Presenting Author: Iyad Mansour
Utilization of an Open Source Project (OSP) Autopilot in a Novel Aquatic Quadcopter Drone

This paper presents the use of an Open Source Project (OSP) autopilot in an unconventional aquatic quadcopter-type drone design that can fly in air and move underwater. In this research, an aquatic quadcopter prototype was developed to evaluate the performance of the vehicle in both mediums. A survey on publicly available OSPs and a comprehensive comparison in terms of software and hardware features and requirements was made to select an appropriate autopilot. The MultiWii project has been selected as the OSP to be used in the design. The autopilot was modified to include a control system to manage the stability and maneuvering. The dual mode control loop has been designed to operate in both mediums (air and underwater) interchangeably to keep the quadcopter under control in all phases of operation. The software developed is presented and experimental results show that the proposed design using the MultiWii OSP achieved stable flight and appropriate maneuverability underwater.

Presenting Author: Kade McQuivey
Implementing the Lever Sign in the Emergency Department (ED) to Assist in Acute Anterior Cruciate Ligament (ACL) Rupture Diagnosis

Introduction: ED physicians are most commonly the first responders in acute ACL rupture. Within the ED setting, ACL rupture is commonly misdiagnosed. Among physicians utilizing traditional clinical tests, recent data demonstrates correct diagnosis in 26% of cases. Beaumont ED diagnoses over 300 acute knee injuries per year. The Lever sign is a new clinical test used in the diagnosis of ACL rupture. Although it has never been introduced in the ED setting, the Lever sign has been demonstrated to have 100% sensitivity and is simple to perform and easy to interpret. **Methods:** From Jan 2017 to August 2017, patients between the ages of 12 and 55 that present to the William Beaumont ED for acute knee injury will be examined utilizing either traditional methods or the Lever Sign. Diagnostic findings in the ED will be compared to those of a sports medicine specialist using MRI as the diagnostic standard for ACL rupture. A survey will be used to collect data on diagnosis, physician confidence in diagnosis, patient age, sex, sporting activity, whether a popping sound was heard at the time of the injury, and whether knee instability occurred. Chi-squared test will be used to compare the diagnostic modalities. **Results:** We anticipate 140 participants in this study. **Discussion:** By implementing the Lever sign in the ED, we hypothesize a decrease in the number of undiagnosed ACL ruptures. Inclusion of the Lever sign as part of the acute knee injury workup within the ED will lead to better health outcomes.

Presenting Author: Kyaw Naing
Time Dependent Patterns of Emergency Department Use by Homeless Persons

Introduction: There has been significant research on disproportionately high use of the emergency department (ED) by homeless persons. Some of the factors associated with homeless individuals' use of ED include medical comorbidities, mental illnesses, alcohol and drug abuse, crime victimization, and use of the ED for social services (e.g. food and shelter). Using these findings, many studies have proposed long term solutions to end the unnecessary use of the ED. As much as there have been long-term efforts to end homeless ED visits, there isn't a short-term solution. By performing a retrospective study on the correlation between homeless emergency department visits and two variables—time of the day and time of the year, one can better distribute social resources to have the greatest impact. **Methods:** Data comes from the National Hospital Ambulatory Medical Care Survey (NHAMCS) years 2007 to 2010. Diseases with prevalence rates affected by weather conditions were extracted and baseline rates for all ED admissions were established. The homeless and the housed population were then compared to assess whether exposure to inclement weather affected use and/or rates of weather-related disease. These analyses should highlight whether there is increased use of ED in specific months of the year and, if so, also show if there is increased use during specific times of the day. **Anticipated Results:** Compared to the housed population, the homeless population is expected to show greater differences in ED use rates at specific times and with greater weather-related disease prevalence as a key associated factor. **Conclusion:** The results are expected to support disproportionately high use of ED by the homeless population but will elaborate the nature of that usage and its patterns in ways that will allow better address of modifiable factors related to overuse.

Presenting Author: Aditi Patil
Visualization of Data Layout and Access of Parallel Program for Productive Performance Analysis and Tuning

Current performance tools, such as TAU, Vampire, Paraver, Jumpshot, Scalasca, Peekperf, EXPERT performance-analysis environment, Cilkview, HPCToolkit, etc., provide measurement and visualization of performance and scalability of parallel program execution to help users for performance analysis and tuning. They, however, do not provide enough intuitive insight on how data are layer-out and accessed during parallel execution, thus relying users'

expertise to manually diagnose issues related to memory access, such as shared cache contention, false sharing and memory bandwidth optimization. We propose a visualization tool dealing with displaying data layout and parallel program access in clear picture of array distribution and computation distribution, maps of program data to the physical NUMA memory region, pattern of memory access, contention on memory bandwidth and shared cache (bandwidth or size). Visualization of data layout will make user sound of peak stack or heap memory usage and peak read/write memory bandwidth contention. Location of memory allocation is a critical factor as NUMA or cache coherence effect can hugely affect the performance of the computation. In order to tackle this challenge, visualization of memory location will help user to identify this bottleneck for the performance issue. In order to solve this issue, we are able to display pictorial presentation of (1) program data access graph and (2) data layout/access in memory layout for different programs to get clear insight of the memory usage. The Program data access graph shows the array and computation distributions from program level. Data Layout in memory systems graph shows how the data is allocated in the NUMA region. This will allow us to find solution for the problem with a greater ease.

Presenting Author: Andrew Pham
Identifying Factors of Effective Computerized Decision Support System

Introduction: Computerized decision support system (CDSS) modules, also known as best practice advisories (BPAs), are becoming more prevalent in electronic medical records to help improve patient safety and quality of care. While many BPAs present context specific prompts to help physicians better manage patients, certain BPAs are less frequently ignored and are better able to prompt physicians to take action. This study looks to establish which BPAs are more likely to get physicians to take clinical action and their characteristics in order to help health IT professionals develop more effective BPAs. **Methods:** BPAs were taken from Beaumont's electronic medical records (EMR) within 2010-2015. Each BPA was then ranked by effectiveness (defined as having a higher percentage of physicians adhering to the suggested action) before being grouped into 1 of 8 categories (knowledge, patient tracking, medication order sets, reminders, differential diagnosis, laboratory/radiological clinical decision support, public health advisories). BPAs were further evaluated by number of alerts generated, length of alert, etc. Pivot tables were used to determine which variables contributed most to a BPA's effectiveness. **Anticipated Results:** BPAs grouped in categories that relate to acute care (i.e. drugs interactions and allergies) generate less alerts, have shorter messages and provide an actionable solution. Therefore, it is expected that these BPAs will show higher percentages of physician taking the suggested action compared to BPAs that pop up more and do not acutely pertain to the patient's current status. **Conclusion:** The results are expected to support the hypothesis that BPAs that trigger in more specific scenarios (i.e. contain more parameters) and are related to potentially adverse event in patients will have a higher percentage of physician action. This will help IT professionals in the future to build effective BPAs and cut down on extraneous ones that impede workflow.

Presenting Author: Deirdre Pitts
Capturing Perceptions: Unconscious Bias in Decisions for Faculty Shortlist Placement

In institutions of higher education, personnel decisions, including hiring, promotion, and tenure, require faculty collaboration. This is a significant difference from the corporate environment, where these decisions are typically driven by middle and top management and closely monitored by a chief human resources officer. Instead of a hierarchical approach to faculty hiring, colleges and universities employ a "faculty search committee". Faculty search committees typically narrow a pool of candidates to a "shortlist;" however, little is documented about the process for identifying suitable candidates for shortlist placement. Unconscious biases and assumptions may clearly impact the faculty hiring process. This phenomenological study examines the role that unconscious bias plays in the faculty hiring process, specifically as it relates to shortlist placement.

Presenting Author: Giovanni Randazzo
Sexual and Romantic Preferences in Written Erotica

This proposal presents a two part study. Part one proposes that a content analysis of written erotica across multiple websites will show distinct patterns of sexual preferences in Lesbian, Gay, and Bisexual (LGB) individuals. Understanding sexual preferences may help us better understand our evolutionary past and existing psychological mechanisms. Sexual preferences are well documented in heterosexual individuals. Research on LGB individuals is lacking and inconsistent in explaining or detailing sexual preferences. Written erotica is new to us as a species but dates back to early civilization. Ancestrally, we would not have read erotica, but we would have shared erotic stories orally. Therefore, popular erotica should mimic popular oral stories shared ancestrally and contain relatable and desirable material. Part two proposes that exposing participants to written erotica will result in changes in perceptions of their monogamous relationships, such as quality of relationship and attraction to mates. This study additionally

will test if reading erotic stories is an organizational behavior, which is a behavior that is used for practice. The second part of the study will investigate gender conformity, sociosexual beliefs, mate retention behaviors, and relationship satisfaction before and after reading written erotica. Perceptions like relationship satisfaction and partner attractiveness should change. An expected result would be a rise in relationship satisfaction and partner attractiveness if the stories describe a less satisfactory relationship or partner compared to the participant's relationship and partner preferences. Expected changes in mate retention should mimic behaviors found in the written erotica. For example, if a common mate retention behavior in written erotica is oral sex, then the participant should respond with an increase in oral sex to mimic successful mate retention behaviors they read about. Gender conformity and sociosexual beliefs are not expected to change, but are expected to have an effect on reaction to the material.

Presenting Author: Arun Kumar Sahu
Big Data Analytics in the Automotive Domain

With the invention of new technologies in manufacturing, auto-makers are able to capture or read the condition of different parts in vehicles say engine status, oil & transmission status, etc. Many of the current vehicles have diagnostic system in place to capture maintenance related information and display it on a dashboard for the vehicle users. If these vehicles related information can be sent to a global database system maintained by the vehicle manufacturer, then this data can be analyzed to predict vehicle component failure. Moreover, vehicle manufacturers can use this captured information to send prescription for recalls or maintenance related promotions to the users. This will facilitate vehicle manufacturers to improve their customer follow-up. To undertake such endeavors, large amounts of data has to be captured and managed effectively. Latest technologies related to big data can be used to accomplish this task. Thus, the objective of this research is to develop the architecture of a big data management system with appropriate mechanisms for automatically collect a large volume of vehicular performance data and analyze them to build predictive models. Along similar lines, usage based insurance system can also be designed. This system works by capturing driven miles and in which city, highway the vehicle is being used. Similarly, driving patterns and traffic conditions can be captured and transmitted to global database system. Further, this information can be utilized by vehicle manufacturers to let their users know about traffic and road conditions to vehicle users based on their location. Again, big data technologies can be used for implementing such a system. The design of such a system will also be the focus of this research.

Presenting Author: Amandeep Sawana
Evaluating the Efficacy of Open versus Robotic RPLND for Treating Testicular Cancer

The incidence of testicular cancer in young men is among the highest when compared to all other solid organ malignancies. Fortunately, due to the predictable course of the disease, the therapeutic modalities for testicular cancer can offer major help in reducing the mortality associated with testicular cancer in young men. With the exception of choriocarcinoma, most of the germ cell tumors metastasize via lymphatic system within the retroperitoneum. One of the established treatment options for germ cell tumors with primary lymphatic spread is open retroperitoneal lymph node dissection (RPLND). Despite several modifications to the technique over the years, open RPLND still poses significant risks of bleeding, chylous ascites, and ejaculatory dysfunction in testicular cancer patients. To address these perioperative complications, minimally invasive robotic RPLND is now being considered for the treatment of testicular cancer. Recent case series have shown benefits of using robotic RPLND over open RPLND in treating testicular cancer and hence, we believe that it is warranted to compare the two intervention for their efficacy for the treatment of testicular cancer. In this study, we will retrospectively compare the perioperative outcomes such as blood loss, length of stay, recovery time, operative time, and ejaculation complications in testicular cancer patients that had undergone open versus robotic RPLND. We will also consider oncologic outcomes such as Lymph Node (LN) yields, LN positivity, and % needing chemotherapy in order to definitively compare the two techniques. Recurrence rate between the two groups will also be evaluated. We anticipate that patients that had undergone robotic RPLND had better perioperative outcomes and similar oncologic outcomes when compared to open RPLND cases. This study will provide a statistical and scientific basis for implementing changes in the current practice for managing patients with testicular cancer.

Presenting Author: Leart Sejdarasi
Synthesis and Characterization of Low Symmetry Subphthalocyanine and Subnaphthalocyanine Analogues

The serendipitous discovery of subphthalocyanines in 1972 established an entirely new class of cyclic compounds that feature boron as the central atom. These peculiar compounds were revisited more than a decade later and were utilized in the synthesis of asymmetric phthalocyanine analogues. Admittedly, this application is among the most

popular for subphthalocyanines, but currently they are an emerging class of standalone compounds that are suited for numerous high technology applications. Subphthalocyanines exhibit a cone-shaped trigonal structure that when unsubstituted, remain completely symmetrical, but the axis of symmetry allows for, upon proper substitution, the generation of chirality and low symmetry. Symmetrical subphthalocyanines do not consistently provide the optimal properties for each niche application, but focus is now on synthesis of designer low symmetry subphthalocyanines that can be suited for any application. In addition to intrinsic chirality, subphthalocyanines feature unique photo-physical properties. Despite the robust structural and chemical properties of subphthalocyanines, arguably the most alluring characteristic of these compounds is that any given property is tunable. The growing interest of subphthalocyanines stems from the synthetic point of view to their applied physical properties. Contemporary research of these compounds has led to my interest in developing a novel synthetic scheme that can be used by researchers to synthesize designer subphthalocyanines that are suited to meet the requirements of their respective fields. My unprecedented approach utilizes bulky substituent groups on the subphthalocyanine and exhibits low symmetry. Synthesis of these compounds has posed great difficulty, but we report the complete synthesis and characterization of four entirely new and exotic subphthalocyanines, nicknamed F4 SPc, F8 SPc, F4 SNc, and F8 SNc. Compounds have been characterized by LC/MS, 1H NMR, 19F NMR, 19F NMR and UV/Vis spectroscopy.

Presenting Author: Ishani Shah
Attitudes and Perceptions of Healthcare Providers Regarding Safe Reduction and Cesarean Sections

Introduction: American College of Obstetrics and Gynecology (ACOG) and Society for Maternal-Fetal Medicine (SMFM) published risk factors that increase the likelihood for a cesarean section (C/S) and provided recommendations to decrease the C/S rate. Analysis of these risk factors within the Beaumont Health System can provide opportunities for the development of educational and preventive methods to safely reduce the C/S rate within the institution. **Methods:** A survey including clinical scenarios of the ACOG/SMFM C/S risk factors was sent to all healthcare providers (obstetricians, residents, and nurses) of the Royal Oak, Troy and Grosse Pointe Beaumont Health System from March 2015 to April 2016. Data was analyzed using profession, experience, willingness to speak up, hospital exposure, and malpractice influence as outcome variables. Analysis was performed utilizing Pearson correlation, student T-tests, chi-square analysis, and Levine's test. **Results:** 250 surveys were analyzed. Baseline results showed that most C/S are done for Category 2 Fetal Heart Rate, about 40% of providers practice defensively, and that more providers are willing to speak up to a nurse, as compared to an attending. Significant findings showed that those with a previous lawsuit are more likely to practice defensively and to speak up when they disagree with a care plan. Nurses, as opposed to physicians, are more likely to wait during labor and less likely to support a C/S, but are less likely to speak up. More experienced providers are more likely to speak up and less likely to induce at 41 weeks. Beaumont Grosse Pointe was more inclined to do elective induction and had less litigation exposure, while both Grosse Pointe and Royal Oak were more likely to support elective C/S compared to Troy. **Conclusion:** These results suggest local risk factors that may be associated with increased cesarean section rates, which can be utilized to develop appropriate interventions to safely reduce the C/S rate.

Presenting Author: Jatin Sharma
Cost Benefit Analysis of Physician-in-Triage Model at Troy Beaumont Emergency Department

Introduction: Overcrowding and long throughput times during peak hours are two problems that Emergency Departments (ED) increasingly face. The purpose of this study is to examine the effect of placing a Physician-in-Triage (PIT) on ED throughput time and determine the costs/benefits of the PIT model at Troy Beaumont. **Methods:** This study analyzed data from when Troy Beaumont tested the PIT model at its ED. Historical control data on ED throughput was gathered from 9/21/2015 to 10/4/2015 during peak hours (6-10PM). A PIT model was implemented and measured from 10/5/2015 to 10/17/2015. From this data, ED throughput variables will be compared with test analysis to see if the PIT model significantly improves ED throughput at Troy Beaumont. A cost/benefit analysis will then be conducted in conjunction with Troy Beaumont to determine whether improvements in ED throughput (direct and indirect) outweigh the cost of installing a PIT model. **Anticipated Results:** We expect to find that installing a PIT model improves ED throughput compared to the control group and leads to cost savings associated with a decreased ED length of stay, improved patient outcomes related to a decreased length of stay, and an increased number of bed hours available for other patients. We will confirm these findings with T-test analysis and financial cost modeling. **Conclusion:** The outcomes of this study will determine the financial impact and throughput changes that result from installing a PIT model at Troy Beaumont Emergency Department.

Presenting Author: Christopher Slon
A Method to Determine the Optimal Datum Layout to Maximize Gauge Repeatability in Dimensional Inspection of a Complaint Part

This paper proposes a method for finding the optimal datum scheme to achieve acceptable gauge repeatability in the inspection process of a compliant part. Currently, there is no rigorous means of evaluating the effectiveness of a datum scheme design in terms of gauge repeatability until actual parts and gauges are available late in the product development process. Changes to the part design or modifications to the gauge at this late stage are usually costly and can result in program delays. This paper proposes the use of standard tolerance stack software with finite element analysis and an optimization algorithm to arrive at the best datum scheme for gauge repeatability early in the design phase thereby avoiding costly and time-consuming changes during the build phase. The method's effectiveness is demonstrated through the improvement in gauge repeatability from an arbitrary datum scheme to the optimal datum scheme.

Presenting Author: Michelle Southward
First Generation College Students

Within this research project, I will perform an in-depth assessment of several factors related to graduation barriers for students who are labeled by institutions of higher education as "first-generation college students." The study will highlight the role a first-generation college student's environment may play in their degree attainment. The overall focus of this study will be to investigate the First-Time-in-Any-College (FTIAC) undergraduate African American students and exam the impact the student's environment has on their persistence and graduation at a 4-year public predominately white institution (PWI).

Presenting Author: Sara Sutton
Survey on the Broadcast Storm Problem in VANET

There has been significant interest and progress in the field of vehicular ad hoc networks over the last several years because of its important applications in transportation to improve road safety, reduce traffic congestion and the response time associated with human reaction to nearby driver, etc., however, there are several technical issues to be addressed for its effective deployment. The purpose of this research is to review broadcast communication in vehicular communication networks and identify different types of broadcast and ways to reduce the broadcast storm problem. The broadcast problem refers to the sending of a message to other hosts in the network. Therefore, broadcasting warning messages can be useful to alert nearby vehicles. But a simple retransmission of warning messages can cause exponential growth of messages over time and serious redundancy, contention and massive packet collisions due to simulations forwarding can occur. As solutions, several schemes, namely probabilistic, count-based, and distance-based schemes have been reviewed and compared in this paper.

Presenting Author: Alicia Tollefson
Perceived Salient Referents and Circumstances of Involvement in Detroit SOUP Neighborhood Events: A Qualitative Inquiry

Introduction: Detroit SOUP, established in 2010, is a highly visible micro-grant making organization which holds monthly dinners to share a meal, ideas, and gives one proposal presented that evening the seed-funding necessary to make a positive impact for Detroit. Since 2013, SOUP has expanded and integrated into 11 localized neighborhood SOUP groups. This qualitative study identifies significant factors to better assess the importance of, and needs of neighborhood groups/events to best serve the Detroit participant base. **Methods:** A salient-belief elicitation based on the Integrated Behavioral Model was conducted to identify salient referents (the people in one's social or personal network) and salient circumstances (one's perception on the various factors that make it easy or difficult) surrounding involvement/attendance at Detroit SOUP. Sixteen individuals from Detroit and neighboring suburbs participated. Content and frequency analysis revealed the salient and most-frequently mentioned responses. **Results:** Most-frequently mentioned salient approving reference for involvement/attendance included: My local community (44%), family/friends (38%), and everyone (31%). The majority (69%) indicated that no one disapproved. The factors that made it easy or difficult for involvement/attendance included: Time/schedule (106%), location (38%), awareness (19%), cost/meal included (13%). Multiple responses were allowed. **Implications:** Results allow for Detroit SOUP to use participant language in marketing material to highlight the normative and control beliefs of involvement/attendance at neighborhood SOUP events. Since participants cited local community (neighbors, church, leaders) as a significant group in one's social or personal network, it's important for SOUP to remain integrated into neighborhoods. Time and location contribute as key involvement factors further conveying

the importance of neighborhood SOUPs, in a city with unreliable public transportation as a hindrance to attend citywide SOUP events. Detroit SOUP should continue to invest time and resources into the neighborhood events to remain engaged with these impassioned localized citizens.

Presenting Author: Justin Yuan
Clinical Significance of Anatomical Variations in the Extensor Compartment of the Forearm

Objective: The extensor compartment of the forearm consists of 12 muscles in either the superficial or deep layer. These muscles are all innervated by the radial nerve and primarily assist with wrist and finger extension. While anatomical variations of extensor forearm musculature are uncommon, it is necessary for physicians working in this area of the body to be aware of any possible variations. In particular, this report intends to highlight the clinical significance of a variation found on the extensor carpi radialis longus (ECRL) muscle. **Methods:** 17 male and 17 female cadavers, for a total of 68 upper limbs, were dissected and the musculature of the extensor compartment of the forearm was assessed for anatomical variations. **Results:** One 89-year-old-female cadaver displayed an accessory muscle belly with a long slender tendon arising from the left and right ECRL muscles. Both additional muscles inserted distally on the abductor pollicis brevis muscle. All other extensor muscles, as well as neurovascularization, were normal and without variation. **Conclusion:** The anatomical variation in this study most likely arose during limb development when the dorsal/extensor primary muscle mass is split to form individual skeletal muscles. Due to their infrequency, knowledge of supernumerary muscles such as this bilateral ECRL variation can help physicians avoid incorrect muscle identification and potential iatrogenic damage. Accessory muscle masses should also not be misconstrued as a tumor or pathologic abnormality on radiographs. Furthermore, it is likely that accessory muscles in the posterior compartment of the forearm only weakly assist with extension of the wrist and fingers. As such, when these variations arise, they may be considered a viable first choice as autografts in muscle reconstruction surgery.

Presenting Author: Yue Zhuo
Factors that Influence Technology Integration in Teaching English as a Foreign Language

The rapid development of information and communication technology (ICT) has brought significant changes in education. In order to achieve pedagogical goals, technology is increasingly integrated into classrooms to assist and promote students' learning. It plays an important role in providing authentic language environment and creates more engagement situation for English as Foreign language (EFL) learners. However, the technology usage in EFL setting is not encouraging, and it is necessary to find the reasons behind that. The paper will summarize the factors that influence technology integration and suggest some possible solutions.

Presenting Author: Iva Ziu
New Immunotherapies for Neurodegenerative Diseases

Alzheimer disease (AD) is a neurodegenerative disorder associated with cognitive dysfunction, and currently without a cure. According to the current paradigm, the main cause of AD is the accumulation of neurotoxic peptide or protein aggregates. One of the key proteins in AD is tau protein which is extensively modified and undergoes aggregation. The current experimental therapies targeting tau protein are based on using treatment with antibodies, i.e. immunotherapies. In some animal models, affected by AD, the treatment with antibodies removed tau pathology and, in some cases, improved cognitive function. However, it is unclear how this antibody treatment really works. In this research proposal, the aim is to gain understanding about how antibodies affect tau protein from the fundamental basic science perspective towards developing effective treatments. To achieve this aim, the biochemical and biophysical methods will be used to evaluate how antibodies to tau affect tau protein biochemistry from two key aspects: 1) antibodies effect on tau modifications (specifically phosphorylation), and 2) antibodies effect on tau aggregation. The findings generated in this project will identify the pathways associated with antibodies inhibition of AD and provide insight into development of viable targets for the treatment of AD and other neurodegenerative disorders.