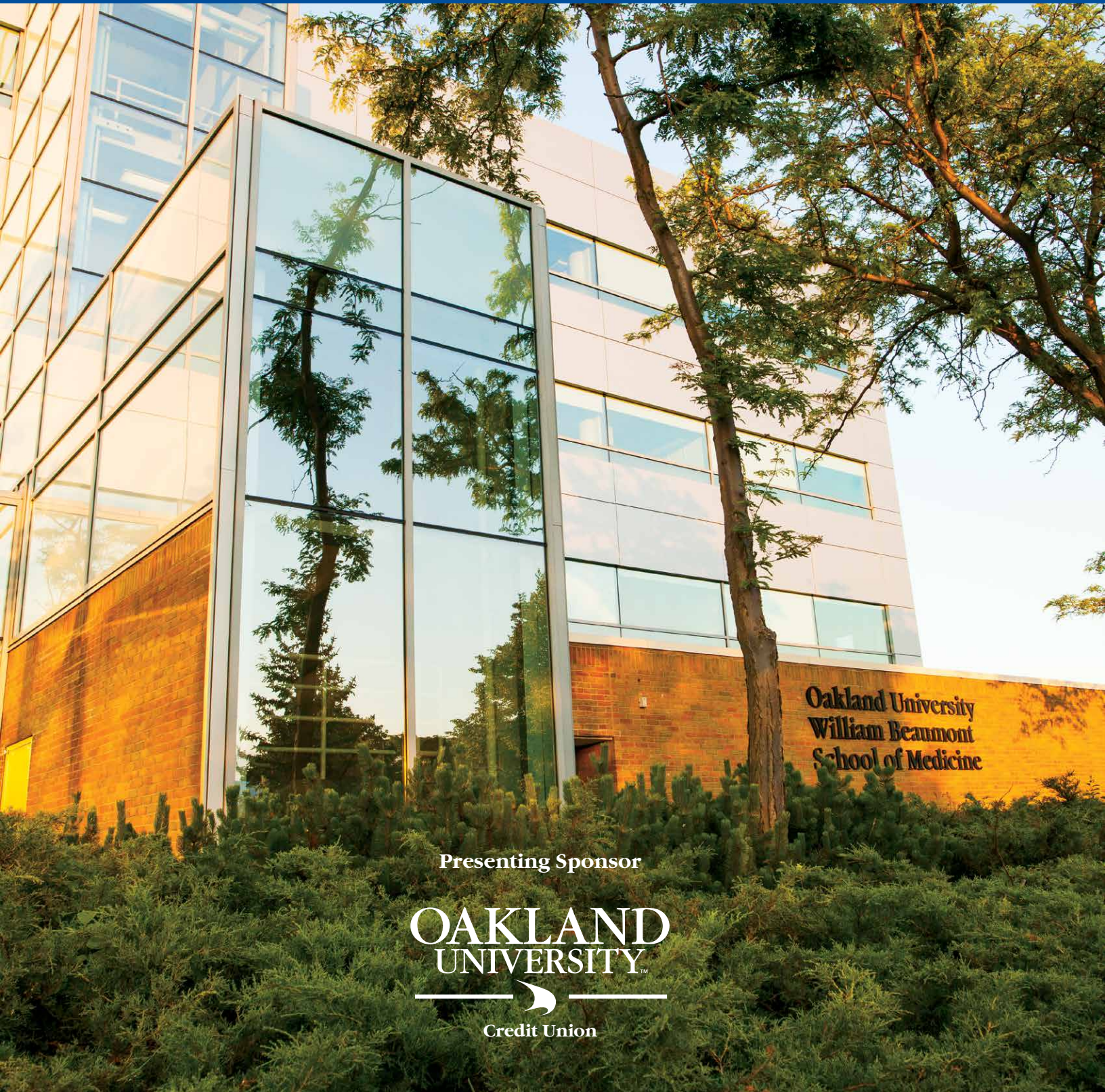


*Class of 2019*

# EMBARK PROGRAM ABSTRACTS

Finalist Presentations | June 5, 2017

OAKLAND UNIVERSITY WILLIAM BEAUMONT SCHOOL OF MEDICINE



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Dear OUWB students, faculty and staff,

It is my pleasure to share with you the Class of 2019 Embark program abstracts. This marks the halfway point for our second-year medical students as they continue working on their Capstone research.

While continuing to enhance their research skills, these abstracts and presentations allow students to develop proficiency in disseminating their findings. The opportunity for them to present various aspects of their project is critical in mastering future presentation skills.

We are pleased to announce that we are able to provide recognition for the top three outstanding presentations this year. The Oakland University Credit Union has generously provided funding for this student milestone. Additionally, OUWB faculty members have volunteered their time to make a determination of which students demonstrate superior presentation skills.

We are delighted that you will have the opportunity to read through this booklet containing abstracts from the Class of 2019. Although most of these students have not yet completed their research, we are confident that you will be able to ascertain the scientific or social impact that this work will have on the health of our community.

Sincerely,

A handwritten signature in black ink, appearing to read 'Robert Folberg'. The signature is fluid and cursive, with a large initial 'R'.

Robert Folberg, M.D.  
Founding Dean  
Oakland University William Beaumont School of Medicine  
Chief Academic Officer, William Beaumont Hospital

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# Exploring Trends in Nonmedical Vaccine Exemptions in Oakland County

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## INTRODUCTION

In 2015, Michigan implemented a policy change to require parents who want exemptions from school or daycare vaccination requirements to attend education sessions at public health offices. In 2015, Oakland County Health Division (OCHD) provided approximately 4,000 vaccine waiver education sessions. The purpose of this study is to analyze electronic medical record (EMR) data to identify (1) the most common reasons parents gave for refusing particular types of school- and daycare-mandated vaccines (MMR, dTAP, Polio, Meningococcal, Hepatitis B, and Varicella); and (2) what percentage of children later received vaccines their parents refused at the waiver education session.

## METHODS

This retrospective cohort study uses data from two sources: the Michigan Care Improvement Registry (MCIR) and the OCHD EMR (Insight) records for the approximately 4,000 children for whom parents attended waiver education sessions. Simple Excel analysis of the most common reasons for nonmedical rejection comes from data recorded into OCHD's Insight records by the public health professionals who completed an education session. Analysis of the number of people receiving vaccines after the education session relies on information from both the OCHD records and the state's MCIR database.

## ANTICIPATED RESULTS

We anticipate that the most common reasons for vaccine rejection among parents and guardians will center around perceived side effects. Also, we anticipate that very few (less than 5%) of children whose parents refused vaccines at waiver education sessions subsequently decided to give their children vaccines they refused.

## CONCLUSION

Identifying areas of parental concern for particular vaccines could potentially inform targeted immunization education outreach efforts. Identifying the effectiveness of education sessions in changing parents' minds about vaccines is important for evaluating the value of waiver education for public health.

# Coronary CT Angiography in the Evaluation of Acute Chest Pain: A 5-Year Cardiovascular Outcome Study

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## INTRODUCTION

Coronary CT angiography (CTA) is an excellent tool for triage of low-to-intermediate risk patients presenting to the emergency department (ED) with acute chest pain. Although it is useful for real-time triage of such patients, few data exist regarding long-term outcomes of such an approach.

## METHODS

Patients presenting to the ED with acute chest pain and undergoing coronary CTA, and with at least 5-year follow-up data were identified from the Beaumont CT registry. Demographics, CTA findings and downstream clinical outcomes including all-cause mortality, acute coronary syndrome and revascularization were evaluated.

## RESULTS

A total of 97 patients (mean age, 51 years  $\pm$  11; 46.9% were male) were identified. Cardiovascular risk factors included hypertension in 42.2% of patients, diabetes in 9.3%, current smoking in 23.6%, and hyperlipidemia in 43.8%. Based on the Framingham risk score categorization for 10-year risk of developing coronary heart disease, 2.2% of patients were at high risk, 16.8% were intermediate, and 81.0% were at low risk. A total of 64 patients (66.0%) had no coronary stenosis, 12 (12.4%) had mild stenosis (1-25%), 14 (14.4%) had moderate stenosis (26-70%), 6 (6.2%) had severe stenosis (71-99%), and 1 (1.0%) had complete occlusion. At 5-year follow-up, 6 patients (6.2%) died, 2 with no stenosis, 2 with mild, and 2 with severe. Four patients were revascularized, 3 with severe stenosis, 2 of whom died, and 1 with complete coronary occlusion. There were no instances of revascularization in any category of patients with less than 70% coronary stenosis. Across all categories, there were no instances of acute coronary syndrome.

## CONCLUSION

Coronary CTA work-up for acute chest pain carries a safe long-term cardiac outcome profile, seen in 95.6% of patients in this study with <70% coronary stenosis. The rates of mortality and revascularization after 5 years, were lower in this group relative to patients with >70% stenosis.

# Stage of HIV at Diagnosis and Retention Rate in Care in an Expanded Testing Site in Detroit

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## 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. 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 collected will include retention rates in care, CD4 counts, and viral loads, and will be analyzed using a chi square test.

## 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, resulting in barriers to continued access to care and decreased retention rates in care.

# Plastic Bronchitis – A Clinical Investigation of My Father’s Diagnostic Odyssey

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## INTRODUCTION

This research study seeks to better understand the symptoms the author’s father endured over the last 12 years and analyze his diagnosis of plastic bronchitis by studying the diagnostic process and corroborating it with actual medical data. Plastic bronchitis is a rare respiratory disease in which patients suffer from congested lungs and severe breathing obstruction. Plastic bronchitis is almost always found in children, often associated with children after undergoing a Fontan procedure for single ventricle physiology, and involves lymphatic flow blockage, none of which apply to this patient’s condition. The rationale for this research is to apply grounded theory and thorough data analysis of over a decade of medical records to arrive at an appropriate research question and develop an algorithm for future case diagnosis and treatment.

## METHODS

This study will be an n of 1 research project. The research question will be derived from the data by completing a patient summary that compiles, organizes and correlates the research study’s pulmonary function tests, drugs taken, personal health, bronchoscopy findings and imaging studies. Principles of grounded theory will govern the research techniques applied in this study.

## ANTICIPATED RESULTS

An algorithm that will suggest appropriate pharmaceutical and therapeutic treatments as well as earlier diagnosis of patients with plastic bronchitis symptoms is the anticipated result.

## CONCLUSION

This study will hopefully provide physicians a proven method of diagnosis and treatment for plastic bronchitis symptoms, so as to prevent patients from enduring the decade long diagnostic odyssey the author’s father has been on.

# Clinical Utility of ConfirmMDx Epigenetic Testing in the Diagnosis of Prostate Cancer

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## INTRODUCTION

Currently, prostate cancer is diagnosed by histopathologic investigation of biopsy core tissues. However, due to the nature of the biopsy procedure, there is a high sampling error and thus negative results often lead to unnecessary and invasive repeat biopsies. ConfirmMDx is an epigenetic test that is able to quantify the methylation status of three prostate cancer-associated genes GSTP1, APC, and RASSF1. It has been reported that these molecular changes occur in histologically normal tissues surrounding cancerous foci. The primary goal of this study is to determine if ConfirmMDx testing can correctly predict negative histopathologic outcomes on repeat biopsies and thus reduce the number of repeat biopsies performed in the US. Currently practicing urologists at Comprehensive Urology (Royal Oak, MI) order ConfirmMDx testing (MDxHealth, Inc., Irvine, CA) on all prostate biopsies. Despite a negative ConfirmMDx outcome, a percentage of these patients undergo a repeated biopsy procedure.

## METHODS

A convenience sample of approximately 200 male patients who had a repeated biopsy within 24 months of a negative histopathologic and ConfirmMDx first-time biopsy will be selected from the electronic medical record. Histopathologic outcomes of the repeated biopsies will be retrospectively collected and merged into one collective database in order to assess if ConfirmMDx can correctly predict outcomes in repeated biopsies. The hypothesis will be assessed using univariate unadjusted analysis.

## ANTICIPATED RESULTS

We anticipate that negative ConfirmMDx results on the first biopsy will correctly predict non-cancerous outcomes in the repeat biopsy. Although we anticipate a high negative predictive value, we also recognize that this value is actually an underestimate as some clinicians have already begun implementing ConfirmMDx testing into their clinical decision-making.

## CONCLUSION

In order to minimize the number of repeat biopsies, our investigative results will permit clinicians to more confidently rely on ConfirmMDx testing and thus improve the clinical utility of such concomitant testing.



# Investigating the parental participation model: Impact on parent's perception of nutritional importance and investigating barriers to proper nutrition in Avondale School District

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## INTRODUCTION

The role of nutrition in health and disease has become increasingly recognized. Improvements in education regarding these topics requires identifying and conducting interventions. One possible intervention to improve the health of children involves the participation of a child's parent in their nutritional education, referred to as the parental participation model. While this intervention has demonstrated a positive change in nutritional behavior in the child, little is known as to how this parent participation model impacts the parent. Further defining the benefits of the parental participation model can help identify ways to further improve parent health, which could have secondary benefits for the child. Identifying parents' perceived barriers to proper nutrition could serve the Avondale School District to improve the effectiveness of programs directed at child health.

## METHODS

A series of optional, in-home, nutritional activities will be distributed to third- and fourth- grade students at Auburn Elementary to be done collectively by a parents and their child(ren). The impact of parental involvement will be assessed by comparing a pre-survey before the activities to a post-survey following the activities. Identification of perceived barriers to proper nutrition will be included in the post-survey and participants will be asked to rank their top three perceived barriers to proper nutrition.

## ANTICIPATED RESULTS

Following participation in take-home activities with their child(ren), parents' perceptions of the importance of nutrition on disease and wellbeing is expected to increase. It is also expected that the more activities a parent completes, the larger their increase in perception of nutritional importance will be.

## CONCLUSION

The results are expected to further our understanding of the impacts of the parental participation model on the parent. Identification of barriers to proper nutrition is expected to help the Avondale School District identify community better direct nutritional service programs.

# The Impact of Early Educational Interventions on Coding for First-Year Emergency Medicine Residents

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## INTRODUCTION

Relative value units (RVU) have been steadily growing in use in emergency medicine (EM) for measuring productivity and therefore, reimbursement. 89% of reimbursement comes from charts with Evaluation and Management (E/M) levels (1 to 5), with 5 providing the most RVUs. Specific criteria must be met for each E/M level to avoid lower reimbursement values. Moreover, previous studies have shown a need for improved documentation education. Consequently, first-year EM residents are an important group, as they begin residency and form documentation practices. Thus, we created educational interventions for coding practices to target this area of education. The primary goal of this study is to determine if implementing early educational interventions will have a significant effect in improving coding and documentation performances. A secondary goal is to correlate the interventional impact with the quantity of queries for coding errors.

## METHODS

11 first-year EM residents were randomized and divided into a control and intervention group.

The intervention group received a 1-hour lecture on ED coding, E/M levels, and documentation macros, prior to their first ED rotation at the base hospital. A pocket card with E/M level requirements was given as well. Bi-weekly feedback was given to the residents to address any patterns of mistakes. The total number of charts for each E/M level and quantity of queries for coding errors were collected from both groups. A paired t-test will be used for analysis.

## ANTICIPATED RESULTS

The intervention group is expected to result in less coding queries from the coding department. We further expect that the E/M chart levels will be significantly different between the groups, with the intervention group having higher amounts of level 5's and lower amounts of level 3 and 4's.

## CONCLUSION

Improved coding and documentation practices based on early educational interventions will result in less coding errors and greater billing performances.

# Care Seeking Behaviors Following Respite Care in People Experiencing Homelessness

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## INTRODUCTION

While several studies show respite centers reduce readmission and decrease total time spent in the hospital for homeless patients, as of yet there is little data on how, or if time spent in respite care alters patient's care-seeking behavior. The primary goal of this study is to address the following questions: How do people experiencing homelessness seek medical care after staying in a respite center following discharge from a hospital, and what are homeless patients' attitudes toward healthcare after a stay in a respite facility?

## METHODS

Clients will be invited to participate in the study during their stay at HOPE Recuperative Shelter, a respite care facility in Pontiac, MI. The study will consist of 3 audio-recorded interviews with these clients, each at different points in their recovery: at admission to HOPE, immediately prior to leaving HOPE, and 3 months-post discharge from HOPE. Approximately 30 participants will be interviewed, with the goal being to obtain saturation on the key domains articulated above. This will be a qualitative study that uses a semi-structured interview design, with questions focused on examining participants' past and present experiences with healthcare, as well as their health literacy. Interviews will be transcribed and analyzed using coding techniques rooted in grounded theory.

## ANTICIPATED RESULTS

The qualitative data from the interviews are expected to parallel trends reflecting other benefits of recuperative care: patients who have gone through respite care will show better health literacy and utilization of primary care resources that they have had help accessing through the medical respite model of care.

## CONCLUSION

The results are expected to help HOPE and other similar medical respite facilities identify strengths and weaknesses in their programs so they can better tailor their resources to provide the most benefit to their clients.

# The Influence of Gender and Gender Norm Disruption on the Male Aggressive Response

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## INTRODUCTION

Research indicates that men comprise the majority of adult sexual abuse perpetrators. A common aim of current research efforts is to determine the factors that contribute to the male aggressive response. The goals of this project are to measure how the disruption of gender norms influences the male aggressive response, and whether men are more aggressive towards men and women who display gender norm-disrupting behaviors.

## METHODS

150 adult men were recruited through community advertisement, screened online for eligibility, and randomly assigned to either positive- or negative-feedback interactions. Within the two feedback conditions, participants were further stratified by random assignment to compete against heterosexual male study confederates (gender norm-conforming condition), heterosexual female study confederates (1<sup>st</sup> gender norm-disrupting condition), or gay male study confederates (2<sup>nd</sup> gender norm-disrupting condition). The participants engaged in research-validated competitive tasks against study confederates and the participants' aggression responses were empirically measured. Analyses of variance (ANOVA) and correlational analyses were used to compare the aggression responses of participants in the different experimental groups.

## ANTICIPATED RESULTS

It is anticipated that participants in the negative-feedback condition will have larger aggressive responses when competing against study confederates who display gender norm-disrupting behaviors (i.e. heterosexual female and gay male study confederates) than participants in the negative-feedback condition competing against study confederates who display gender norm-conforming behaviors (i.e. heterosexual male study confederates). Furthermore, it is anticipated that participants in the negative-feedback condition will have larger aggressive responses when competing against gay male and heterosexual female study confederates compared to participants in the positive-feedback condition who compete against same-group confederates.

## CONCLUSION

The results of this study are expected to improve the research community's understanding of the factors that influence the male aggressive response and provide greater insight into the factors that motivate adult men to perpetuate sexual abuse.

# Videofluoroscopy: Decreasing risks while providing useful information for pediatric velopharyngeal surgery

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## INTRODUCTION

The surgical correction of residual velopharyngeal insufficiency (VPI) in pediatric patients is customized according to findings on imaging procedures: multiplanar videofluoroscopy (MPVF) and flexible videonasopharyngoscopy (FVNP). Recently, the use of MPVF has been challenged because of potential risks from using ionizing radiation in children. The primary goal of this study is to determine if current procedures effectively minimize radiation dose received during MPVF. Additionally, it will determine if the use of specific, actual-size measurements obtained from MPVF optimizes surgical outcomes.

## METHODS

Forty-three pediatric patients with residual VPI resulting from cleft lip, cleft palate, and/or submucous cleft palate have been studied to date. All patients underwent pre-operative MPVF and intraoperative FVNP for the planning of surgical correction. Radiation dosage data in each case was recorded. Pre and post-operative measurements of velopharyngeal closure and nasal emission scores were recorded to assess surgical correction, speech quality and resonance. VPI correction rate will be compared to standardized data reported by centers that do not utilize MPVF.

## RESULTS

Radiation dosage for MPVF ranged from 0.58 to 7.58 mSv; Mean 2.95 mSv; SD 1.58 mSv. Preoperative nasometry demonstrated mean nasalance ranging from 28% to 98%; Mean 54.8%; SD 18.88. Postoperatively mean nasalance was significantly reduced in all patients with nasal emission and VPI being eliminated in 12 of 14 patients (86%).

## CONCLUSION

Radiation dosage for MPVF can be effectively minimized and kept within currently acceptable ranges for pediatric populations. The combination of MPVF and FVNP for surgical planning is reliable for VPI correction with a highly successful outcome.

# “ADverSE” – Allergy Determination versus Side Effects

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## INTRODUCTION

Inconsistencies exist between patients' documented allergies to antibiotics recorded in the electronic medical records and patients' actual allergies (or lack thereof). Documented antibiotic allergies can lead to worse outcomes due to limiting the use of the most appropriate antibiotics. We have analyzed the percentages of patients reporting antibiotic allergies and associations between high numbers of reported allergies and problematic diagnosis, which are often considered to have a psychiatric component.

## METHODS

For the year 2015 all inpatients at Beaumont Royal Oak, Troy, and Grosse Pointe were reviewed for allergies listed in the EPIC electronic medical record. A limited data set was constructed for patients who had an antibiotic allergy listed, and the problem list and past medical history were obtained for each of these patients. Diagnoses and number of reported allergies were examined to determine if various problematic diagnoses correlated with higher numbers of reported allergies.

## RESULTS

For the year 2015, 35,304 unique patients were identified with any reported allergy, of which 19,284 had a reported antibiotic allergy. For the antibiotic allergy group, the number of reported allergies varied from 1 to 62; 5828 reported a single allergy (30.22%), 908 reported  $\geq 10$  allergies (4.71%), and 114 reported  $\geq 20$  allergies (0.59%). There was a strong association between multiple allergies and the diagnosis of fibromyalgia or interstitial cystitis, a neutral association between multiple allergies and fracture, and a negative association between multiple allergies and lymphoma.

## CONCLUSION

Patients with problematic diagnoses, dismissed as either psychiatric in nature or even malingering, have a high correlation with reported allergy number. This potentially leads to inferior treatment of a true infection due to limits imposed on antibiotic choice based on allergy history. Careful determination of whether a reported allergy is a true allergy, intolerance, side effect, or potentially incorrect documentation is needed to improve treatment in these patients.

# Growing Up With A Cognitively Impaired Sibling: The Impact of Age on Empathy

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## **INTRODUCTION**

Much research has been done in regard to what cognitively impaired individuals experience as they progress through life, but there is not much out there on what their siblings go through. Studies have suggested that families with one or more cognitively impaired children experience a significant amount of emotional distress. The primary goal of this study is to determine whether or not individuals with a cognitively impaired sibling experience a change in empathy as they age and mature.

## **METHODS**

Through the Wish Upon a Teen Foundation, 30 siblings from 30 different families of children with a cognitive disability will be identified and recruited to participate in this study. Each participant will be asked to complete a survey designed to evaluate their level of empathy at three stages of life: pre-teenage, teenage, and post-teenage years. Descriptive statistics including mean and standard deviation will be calculated for empathy scores at each phase of life. All scores will be plotted and a linear regression will be conducted to determine any correlation between age and empathy.

## **ANTICIPATED RESULTS**

Individuals with a cognitively impaired sibling are expected to exhibit a positive correlation between age and empathy. It is expected that individuals experience an increase in empathy as they progress through the pre-teenage, teenage, and post-teenage years.

## **CONCLUSION**

The results of this study will provide a greater understanding of the challenges faced by families raising one or more cognitively impaired children. Acknowledging the dynamic emotions of individuals toward their cognitively impaired sibling will prove useful in providing support, especially during the younger years.

# Evaluation of Health Literacy Among Homeless Patients in a Recuperative Care Facility

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## INTRODUCTION

The purpose of this study is to evaluate changes in health literacy among homeless patients at HOPE Recuperative Center in Pontiac, Michigan. This is a specialized, long-term shelter for homeless adults with medical needs that cannot be managed in a traditional shelter. The results of this study will help homeless service agencies implement effective methods to improve health literacy among their clientele and inform policy recommendations at the city, state, and national levels.

## METHODS

This study is qualitative, utilizing a semi-structured interview design and analytic techniques rooted in grounded theory. Each guest at HOPE Recuperative Center will be invited to participate in a series of open-ended interviews regarding their health literacy and experiences at the shelter, including ability to find information about their health conditions, care, and insurance and manage logistical tasks necessary to access healthcare. Ideally, these interviews will take place near the times of admission and discharge from the recuperative center. Interviews will be audio recorded, then coded and analyzed using analytic techniques akin to grounded theory.

## ANTICIPATED RESULTS

It is anticipated that interviews with twenty to thirty participants will demonstrate that HOPE Recuperative Center provides opportunities for patients to learn about available resources for healthcare, housing, nutrition, and other necessities and gain skills in managing their own health conditions and care. Additionally, results likely will indicate areas for improvement of health literacy education for clients.

## CONCLUSION

Empowering patients with information about their health and available resources is critical for continued management of their health, especially if they are discharged to stable, independent housing. Improving patient education at recuperative centers therefore represents a critical aspect of long-term health promotion. The findings of this study will help improve patient education efforts at the shelter and will be informative for similar programs around the country.



# Multidisciplinary Collaboration between Anatomy, Urology, Obstetrics and Gynecology (OBGYN) Faculty to Teach Clinical Anatomy to Second Year Medical Students during the Reproductive Biology Course

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## INTRODUCTION

Each year, second-year medical students at Oakland University William Beaumont School of Medicine partake in a clinical anatomy lab during the Reproductive Biology Course. The clinical anatomy lab utilizes anatomy and clinical faculty to teach students to identify, assimilate and correlate relevant anatomy to clinical cases. The primary goal of this study was to evaluate student-perceived effectiveness of clinical anatomy labs and integration of taught concepts by pre-clinical medical students. A secondary goal of this study was to describe an effective clinical anatomy and imaging lab model.

## METHODS

Anatomy faculty collaborated with clinical Urology and OBGYN faculty to select clinical cases for an interactive clinical anatomy lab including case presentations, imaging, and cadaver dissections. Clinical faculty were oriented to the cadaver while the anatomy faculty were oriented to the clinical cases. Clinical faculty staffed each case with 8 students rotating through each station for 30 minutes. The 6 clinical cases demonstrated were difficult urination, testicular mass, urinary obstruction, ectopic pregnancy, perineal lacerations, and menorrhagia. The cases utilized a multiple-choice format to engage students and promote discussion of clinical issues pertaining to a diagnosis. Students completed an anonymous pre and post knowledge survey comprising 13 multiple-choice questions related to the anatomical and clinical correlations reviewed in lab and a post curriculum evaluation survey.

## ANTICIPATED RESULTS

The students' average pre-knowledge score was 5.58 and post curriculum was 9.05  $p < 0.001$ . Overall students indicated the curriculum had increased their knowledge and interest in urology and OBGYN as 7 on a maximum Likert score of 10.

## CONCLUSION

Collaboration between Anatomy, clinical urology and OBGYN aids in the students' ability to integrate anatomy with clinical reasoning and practice outside of lecture material. It also provides opportunity for interaction and cross learning between basic scientists and clinical faculty.

# Occipital Nerve Neurolysis and Resection for Treatment of Occipital Neuralgia

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## INTRODUCTION

The posterior scalp receives sensory innervation from the greater and lesser occipital nerves. Irritation to these nerves due to inflammation or trauma can result in a sensation of pain, called occipital neuralgia. Although it is felt to be relatively rare in clinical practice, pain related to occipital neuralgia can be incredibly debilitating. The goal of this study is to determine if occipital nerve neurolysis with resection, removal of the entire nerve, 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 25 patients who underwent occipital nerve neurolysis and resection. Data comparing levels of reported pain and non-pain symptoms at pre-operative versus post-operative visits was compiled. 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. The primary aim of this analysis is to compare the one-year success rate of treatment with occipital nerve neurolysis with resection to published success rates using a one group Chi-Square test.

## ANTICIPATED RESULTS

For cases of medically refractory occipital neuralgia, we propose surgical neurolysis and resection to be the best treatment option. Specifically, we believe our study will show that patients undergoing nerve resection will demonstrate greater pain relief with a lower recurrence rate when compared to other treatment modalities, allowing patients to return to their life activities and experience less overall suffering.

## CONCLUSION

The results are expected to support the hypothesis that surgical neurolysis with resection leads to greater pain relief and decreased frequency of pain recurrence when compared to other treatment options.

# Relationship Between Attention Deficit Hyperactivity Disorder and Pediatric Hospital Trauma Admissions

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## INTRODUCTION

Accidents and trauma are a leading cause of death and disability in children and adolescents in the United States. Currently, there exists a gap in the research on risk factors of pediatric accidental trauma, particularly on the relationship between attention deficit hyperactivity disorder (ADHD) and trauma. The primary objective of this study is to elucidate the relationship between pediatric ADHD and pediatric hospital trauma admissions. We hypothesize that pediatric patients with ADHD are more likely to engage in behavior that places them at greater risk of hospital trauma admissions. Our goal is to contribute to the understanding of factors that place pediatric patients at greater risk of involvement in accidental trauma and to develop prevention strategies and recommendations based on these findings.

## METHODS

A cohort of pediatric patients admitted to Beaumont Health System—Royal Oak between January 1, 2016 and December 31, 2016 will be identified based on their admission status as a pediatric trauma. Their medication history, injury severity score (ISS), pediatric risk of mortality score (PRISM), and pediatric index of mortality score (PIM) will be collected from their charts. Statistical analysis will be conducted to explore the relationship between ADHD diagnosis and the severity of trauma.

## ANTICIPATED RESULTS

We expect that pediatric trauma patients with a diagnosis of ADHD will make up a larger proportion of pediatric trauma admissions. We also expect that pediatric trauma patients with a diagnosis of ADHD will be associated with increased ISS, PRISM, and PIM values.

## CONCLUSION

The results are expected to support the hypothesis that pediatric patients with a diagnosis of ADHD are at increased risk for involvement in situations with risk factors for hospital trauma admission and to inform strategies that health care providers can utilize to reduce the risk of pediatric patient involvement in accidents resulting in hospital trauma admission.

# Psychiatric and Behavioral Side Effects of Antiepileptic Drugs in Adults with Epilepsy

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## INTRODUCTION

Psychiatric and behavioral side effects (PBSEs) are common, undesirable effects associated with antiepileptic drug (AED) use. The objective of the study was to compare the PBSE profiles in a large specialty practice-based sample of patients taking both older and newer AEDs.

## METHODS

As part of the Columbia and Yale AED Database Project, we reviewed patient records including demographics, medical history, AED use, and side effects for 2667 adult patients (age $\geq$ 18 years) newly started on an AED monotherapy regimen. PBSEs were determined by patient or physician report in the medical record, which included depressive mood, psychosis, anxiety, suicidal thoughts, irritability, aggression, and tantrum. Significant non-AED predictors of PBSE rate were first determined from 83 variables using logistic regression. Predictors were then controlled for in the comparison analysis of the rate of PBSEs and intolerable PBSEs (PBSEs that led to dosage reduction or discontinuation) between 18 AEDs.

## RESULTS

PBSEs occurred in 7.6% of patients and led to intolerability in 5.3% of patients. History of psychiatric condition(s) and intractable epilepsy were associated with increased incidence of PBSE. Levetiracetam (LEV) had the greatest PBSE rate (19.2%). This was statistically significant when compared to the aggregate of the other AEDs ( $P<0.001$ , OR=4.74). LEV was also significantly ( $P<0.001$ ) associated with higher intolerability rate (14.3%, OR=5.02), dose decreased rate (8.7%, OR=5.98), and complete cessation rate (5.5%, OR=3.38), when compared to the aggregate of the other AEDs. Carbamazepine (CBZ) was significantly associated with a decreased PBSE rate (2.0%, OR=0.23) and a decreased intolerability rate (1.4%, OR=0.23) compared to the other AEDs. Lamotrigine and valproate trended towards decreased PBSE rate and intolerability, but were not significant.

## CONCLUSION

PBSEs occur more frequently in patients taking LEV than any other AED, and led to higher rates of intolerability. The opposite effects were seen in patients taking CBZ.

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

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## 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 were generated 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  $\pm$  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.

# In-vivo Measurement of the Strain of the Iliotibial Band in Motion

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## INTRODUCTION

Iliotibial band syndrome (ITBS) is one of the most common overuse leg injuries. Two current theories – friction and compression theory – attempt to correlate the cause of lateral knee pain to the inflammation of the iliotibial band (ITB). Despite lack of consensus, both theories suggest that strain plays a key role in all potential mechanisms of injury. Currently, there is a gap in the literature, which attempts to correlate a direct measurement of strain in the ITB to the incidence of ITBS. The purpose of this study is to measure strain in the ITB non-invasively over the skin, as a basis for further evaluation of ITBS as correlated to changing strain rates.

## METHODS

Strain will be measured using a 'strain measurement apparatus' consisting of strain gauges in a carbon fiber casing. The strain measurement apparatus will be placed on biomimetic skin overlying a tendon and a porcine tendon to obtain an estimated measure of strain upon manipulation of the cords to known forces. The output generated by the apparatus will be correlated to the actual strain measured by a load cell placed directly on the tendon. The strain measurement apparatus will be manipulated to maximize precision throughout the experimental process.

## ANTICIPATED RESULTS

The anticipated outcomes of this study will be a correlation between the strain measured by the apparatus and the force applied to the biomimetic tendon and/or porcine leg, as measured by the load cell. We further expect the novel strain measurement apparatus will be an effective measurement tool for assessing strain in a dynamic human model ITB.

## CONCLUSION

The results are expected to support the hypothesis that strain can be measured in the ITB directly using strain gauges. The efficacy of the strain measurement apparatus will provide a basis for further non-invasive evaluation of the ITB as correlated to ITBS in human models.

# The Effect of Acupuncture Therapy on Gastrointestinal Symptoms of Patients Seen in Integrative Medicine

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## 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 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 medications, 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  $\leq 0.05$ ) 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.

# Type II Diabetes Risks Among Nigerian Born Immigrants

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## INTRODUCTION

Rates of type II diabetes for immigrants tend to increase with increasing stay in the United States. In this study, knowledge of risk factors for type II diabetes among Nigerian immigrants in metro Detroit is assessed. The result of this study may change how doctors approach patients with pre-diabetes diagnoses.

## METHODS

Participants are recruited from the Redeemed Christian Church of God in Greenfield Road, Detroit. All participants are Nigerian born immigrants eighteen years and older. Each participant completes a multiple choice response survey after church service in one of the church activity halls. Each survey question assesses specific type II diabetes risk factor. Completed survey responses are recorded and percentages of correct and incorrect responses are calculated for each question.

## ANTICIPATED RESULTS

It is expected that at least fifty participants will complete and return the surveys. Over 70 percent of Nigerian immigrants are expected to know that obesity, family history of diabetes, inactivity and age greater than 45 increase the risks for diabetes. Furthermore, less than 50% of participants will know that high blood pressure, high cholesterol, and hyperlipidemia are strongly associated with adult onset diabetes.

## CONCLUSION

This study shows that inadequate knowledge of diabetes risk factors is partly responsible for type II diabetes among African Americans in the United States.



# Public Health Education about Immunization

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## INTRODUCTION

In 2015, Michigan became the first US state to require parents to attend vaccine education sessions at public health offices if they wanted to send their unvaccinated or under-vaccinated children to school or state-recognized daycare centers. The aim of this study is to identify what the vaccine educators do – and what they think about what they do – during vaccine education sessions.

## METHODS

Vaccine waiver educators at Michigan’s local health departments participated in one-hour focus groups or interviews. Educators were asked questions about their experiences and judgments surrounding vaccine education sessions. All three investigators independently coded transcripts and used the Constant Comparative Method (CCM) to identify themes.

## ANTICIPATED RESULTS

17 interviews have been completed; 14 interviews remain. The most frequent themes emerging thus far include a transition from an informative-persuasive method to a non-adversarial approach; the emotional burdens of education sessions on parents and educators; and the importance of flexibility in the goals and methods for education sessions. Other themes include the various reasons parents refuse vaccines or want to adopt a different vaccination schedule; the value of extensive public health experience for waiver education; and the evaluation of the training educators received. The vaccine waiver educators wanted more information about the effectiveness of their work; they wished the immunization schedule were more manageable for parents; and, ultimately, they hoped that the cooperative relationships they were promoting with parents would pay future dividends for children’s (and parents’) healthcare.

## CONCLUSION

This exploratory study is the first to investigate the role of public health personnel in vaccine waiver education. This research has implications for healthcare delivery, vaccine hesitancy, health communication, and immunization policy.

# Treating Victims of Sexual Assault: The Self Perceived Role of a Physician

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## **INTRODUCTION**

A recent study found many victims of sexual assault (SA) did not receive the care they expected upon initial presentation to a physician. Specifically, victims expected psychological care, yet a significant number of victims did not receive any. This study showed there is a gap that has formed between what patients expect or need and what physicians offer. Why is it that physicians appear to fall short treating victims of SA?

This pilot study examines the scenario of sexual assault treatment from the physician's perspective. Through understanding and analyzing current physician practices, psychosocial challenges, and educational limitations surrounding the treatment of SA victims, we will identify areas for improvement in policy and patient care.

## **METHODS**

Residents from the Beaumont Health System will be given a short survey regarding their history, practices and anticipated patient needs surrounding the treatment of SA. Residents from Emergency Medicine, Internal Medicine, Family Medicine and Obstetrics and Gynecology were recruited for the purposes of this survey. Specialties were selected based on perceived likelihood that SA victims initially present to a physician. The survey contains both closed- and open-ended questions. This will allow residents the opportunity to describe their experiences without being limited to anticipated responses. Secondly the survey aims to identify experience, comfort, and educational background treating victims of SA.

## **ANTICIPATED RESULTS**

Analysis of the survey may show difference in treatment between medical specialties. The data may also show variation between treatment guidelines and clinical practice. Free form responses may aid in identifying barriers preventing physicians from providing the best possible care of SA victims.

## **MOVING FORWARD**

Results of this pilot study could merit further research into clinical treatment of SA victims. Results could also prompt changes in education of medical students, residents and attending physicians. Lastly, results could have an impact on department policy for treatment of SA victims.

# Effects of Sleep on Emotional Processing in Individuals with PTSD

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## INTRODUCTION

There has been copious research regarding the effects of PTSD on the informational processing ability of affected individuals, most commonly focusing on the interferential effects of this disorder. In addition to studying the interferential effects, this study sought to explore the facultative effects of the disorder, and the influence of a short period of sleep on the combined effects of the disorder.

## METHODS

A cohort of one hundred fifty Oakland University students was recruited; fifty of these students had a positive CAPS-5 survey for PTSD, fifty had a positive PCL-5 survey for a traumatic experience, and fifty were negative for both. Subjects were required to complete lexical decision tasks (LDT's), which were classified as tasks of facilitation or interference. Subjects completed 45 facilitation tasks and 45 interference tasks, and were then randomly assigned to a 90-minute break period of sleep or rest, after which they completed 45 additional trials of facilitation and interference, in addition to the original pre-break trials. The results will be analyzed by ANOVA, ANCOVA, or regression.

## ANTICIPATED RESULTS

It is expected that the response times for the interference trials will be significantly higher for individuals in the PTSD group than for participants in the trauma or control groups. The individuals assigned to the nap group are expected to have significantly lower response times for all trials than individuals assigned to the rest group.

## CONCLUSION

If the results are as anticipated, this study will provide evidence of the benefit of napping on the attentional processing of individuals with PTSD, and may lead to lifestyle improvements for those individuals.

# Tai Chi Intervention for Autism Spectrum Disorder: A Pilot Study

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## **INTRODUCTION**

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder, often with early onset, that is characterized by social isolation and poor communication skills. Although the causes of autism are still hotly debated, it is agreed upon that ASD involves a multisystem impairment. Current ASD treatments normally involve behavioral therapy and consultation, often at an early age; however, alternative therapy may serve as a good supplemental option for patients wishing to explore their options. Despite many emerging alternative therapies, there is currently minimal research on Qigong, an ancient Chinese practice of movements performed in conjunction with deep breathing, as an interventional therapy for ASD. The primary goal of this study is to determine if Qigong will result in improved social and motor skills in patients with ASD.

## **METHODS**

Qualifying participants from OUCARE's summer program were recruited and their baseline social data were collected through the Self Assessment Manikin (SAM) and the Social Relationships Comfort Index (SCRI). Their baseline motor skills were obtained quantitatively through sensor measurements while performing "Playing Hands" (a Tai Chi movement). Before and after every Tai Chi session, occurring two times per week for two weeks, participants will be given the SAM and SCRI for intra-subject comparisons. Following program completion, participants will be asked to complete the Playing Hands for motor attunement measurement.

## **ANTICIPATED RESULTS**

Participants are expected to improve in both social skills (via SCRI and SAM scores) and motor attunement measurements when compared to baseline measurements. We further expect the participants to demonstrate an increased level of empathy.

## **CONCLUSION**

The results are expected to support the hypothesis that Tai Chi intervention may improve social and motor skills in children with ASD. Findings will further support inexpensive and easily adoptable supplemental therapy in addition to traditional behavioral therapy without significant burden financially and/or time wise.

# Evaluating Patient Satisfaction in Autologous Breast Reconstruction vs. Implant Reconstruction

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## INTRODUCTION

Current numbers indicate that 1 in 8 women will develop breast cancer, and the rate of women choosing mastectomies has been on the rise in the last decade. With more women choosing mastectomy, there is an increased need for reconstruction options. The primary goal of this study is to evaluate patient satisfaction in both autologous and implant breast reconstruction. Additional goals include determining if adjuvant treatment of cancer predisposes a patient to better outcomes with a particular reconstructive technique and if a correlation exists between patient profile and preferred reconstruction.

## METHODS

Questionnaires will be utilized to evaluate the patient satisfaction component of the study, and a chart review will be conducted to evaluate the other aims relating to outcomes and patient profile. Patients eligible for the study include females between the ages of 18 and 70 who have undergone mastectomy after breast cancer diagnosis. Questionnaires will be sent via mail and online via SurveyMonkey to 1000 patients with the goal of collecting 250 responses. A chi-squared test will be used to evaluate patient satisfaction for each reconstructive procedure, and a two-sample T-test will be used to compare both cancer treatment and outcomes as well as patient profile and preferred reconstruction.

## ANTICIPATED RESULTS

Current literature supports good outcomes for both autologous reconstruction and implant reconstruction, and due to unique complications that can arise from each, it seems probable that patient satisfaction and preference will depend on factors like adjuvant cancer treatment as well as patient profile.

## CONCLUSION

The results of this study are expected to provide women with additional information about options for breast reconstruction and also to warrant further investigation into different types and techniques of reconstruction.

# Up-regulation of pro-inflammatory *s100a8* and *s100a9* with high fat diet consumption in C57BL/6 mice

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## INTRODUCTION

In a preliminary study performed, up-regulated levels of two pro-inflammatory molecules - *s100a8* and *s100a9*, were demonstrated in C57BL/6 mice that were fed a high fat diet for six months. We are conducting a study to verify the presence of these pro-inflammatory molecules with the consumption of a high fat diet, and how they change with the consumption of a high fat diet.

## METHODS

C57BL/6 mice will be separated into two groups – one will be given a control diet, while another will be fed a high fat diet. They will be provided this diet for differing lengths of times. These mice will then be exsanguinated and their platelets analyzed for the levels of pro-inflammatory molecules *s100a8* and *s100a9*. RT-PCR will quantify RNA levels, while an ELISA will determine the protein levels. Chronic exposure to a high fat diet will also be investigated, with the same protocol.

## ANTICIPATED RESULTS

Mice that consumed the high fat diet are expected to have elevated levels of *s100a8* and *s100a9* compared to their control diet counterparts. The greater the length of time the mice are exposed to high fat diet, the greater the elevation of these proteins.

## CONCLUSION

This study will further elucidate how a high fat diet may affect our health. If pro-inflammatory molecules are up-regulated with high fat diet consumption, this may highlight the pathogenesis of inflammatory conditions such as atherosclerosis. The pathogenesis of atherosclerosis remains largely unknown, and this study may elucidate a potential therapeutic target.

# Clinical Uncertainty Uncovers Bias Against Homeless People in the Emergency Room

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## INTRODUCTION

Although health care professionals often provide equal treatment to homeless and non-homeless individuals, social stigma against homeless individuals prevails when clinical uncertainty exists. That is, only when the appropriate course of treatment of a patient is relatively unclear (clinical uncertainty), differences between the treatment of homeless and non-homeless individuals appear. In the ultimate interest of pursuing health care equity, this paper attempts to illuminate those differences.

## METHODS

The study will be conducted using statistical analysis of a national compilation of data from the National Hospital Ambulatory Medical Care Survey (NHAMCS), a survey designed to provide objective, reliable information about ambulatory medical care services in the United States. The medical treatment of homeless and housed patients will be compared at equivalent situations of clinical uncertainty using the NHAMCS data.

## RESULTS

Compared to the non-homeless group, the homeless population is expected to be treated by attending physicians less frequently when presenting with a triage level of 3. Instead, other health care professionals such as physician assistants and nurses will attend to homeless patients to a larger extent than they would for a housed patient with a triage level of 3. At low triage levels (representing emergent medical issues), it is more obvious that patients need to be treated by an attending physician. At high triage levels (representing non-emergent medical issues), whichever health care professionals are available can often address patients' needs. Therefore, homeless patients only see attending physicians less than housed patients in less obvious scenarios (triage level 3).

## CONCLUSION

Although the health care system often treats homeless and housed individuals equally, situations of clinical uncertainty allow for the manifestation of bias against homeless people.

# Tracking Beneficial Outcomes of Probiotic Therapy During Treatment of Autoimmune Disease

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## INTRODUCTION

An unknown factor of probiotic therapy is the extent to which the patient's initial level of gut bacteria affects efficacy. This pilot-project will measure the change from baseline of the painful symptoms a patient diagnosed with intestinal autoimmune disease experiences using probiotic therapy. This result will then be compared to the patients initial and end stool-level of *Lactobacillus*, to determine to what extent the patient's initial level of gut flora influenced their probiotic therapy.

## METHODS

After identification, subjects will be made aware of the study during regular visits to Beaumont Integrative Health. If they express interest they will be consented. Following consent they will take an initial on-line validated questionnaire administered by the Qualtrics™ survey service. The subjects will be de-identified and sorted into groups dependent on their stool kit level of *Lactobacillus* (low level, mid level, high level). The subjects will be given another validated questionnaire at 2, 4, and 6 months. At the end of this six-month period the subjects will complete a final stool kit to measure the level of *Lactobacillus* present in their colon. At the conclusion of this time-period the subject groups will be statistically analyzed by two-tailed t test for significant correlation between change in initial symptoms and *Lactobacillus* level. Acceptable p will be <0.05.

## ANTICIPATED RESULTS

A maximum of 50 subjects will be recruited, each displaying the symptoms of autoimmune intestinal inflammation. Within the three subject groups, it is anticipated that the high *Lactobacillus* group will exhibit a greater response to probiotic therapy, and therefore a greater reduction in symptoms, than the middle, or the low *Lactobacillus* level.

## CONCLUSION

The results are expected to support the hypothesis that the outcome of probiotic therapy is dependent on the preexisting population level of the subjects gut microbiome, as indicated by the *Lactobacillus* level.



# Cloud-Based Learning: Interactive Team-Based Learning instruction using Google drive

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## INTRODUCTION

Self-directed learning and interpersonal communication are essential for modern physicians entering multidisciplinary healthcare teams in a rapidly evolving field of new technologies, knowledge, and methods. There have been a number of new teaching methods employed in medical schools, including team-based learning and problem-based learning, which facilitate collaborative problem solving. Nevertheless, successful implementation of these conventional instructional methods requires advanced preparation and assessments. Here, we will describe the process to create an instructional method that requires little preparation and utilizes constructivist principles to effectively promote self-directed learning, interpersonal skills, and higher-order levels of cognitive skills.

## METHODS

We will use Google Drive (a cloud-based document-editing application) to implement our instructional method called Cloud-based learning (CBL). CBL consists of three sections: a) a didactic lecture to review foundational concepts, b) a group activity in which students collaborate to create a document comparing three key lung infections on Google Drive while professor(s) provide real-time feedback, and c) a brief lecture integrating the microbiological bases and the immune-pathomechanisms of infections. CBL contains pre- and post-formative assessments as a learning tool for students and to quantitatively determine student progress. Our study will also incorporate a survey to evaluate student satisfaction and elicit ideas for improvements of this educational tool. The survey will ask students to compare aspects of TBL, CBL, flipped-classroom, and didactic lecture such as preparation time, quality of feedback, knowledge acquisition, and teamwork skills.

## ANTICIPATED RESULTS

We anticipate that students will perform better on the post-formative assessments than the pre-formative assessments and will feel that CBL requires less preparation time than TBL, while being at least as effective as didactic lecture.

## CONCLUSION

The creation of this educational instruction may improve the outcomes of medical students when compared with direct instructional methods. Finally, it may also allow students to develop clinical reasoning and interpersonal skills, which are essential characteristics for the next generation of physicians.

# Evaluating Physician Adherence in Beaumont Health to the 2014 AHA/ACC Ticagrelor Guideline

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## INTRODUCTION

In September 2014, the American Heart Association (AHA) and the American College of Cardiology (ACC) published novel guidelines for the management of patients with non-ST elevation acute coronary syndrome (NSTEMI-ACS), emphasizing the administration of ticagrelor over clopidogrel as the dual antiplatelet agent of choice in NSTEMI-ACS patients who receive a coronary stent. This Capstone study seeks to track the prescription rate of ticagrelor by Beaumont physicians over the course of the three years immediately following the guideline revision. The ultimate goal is to assess whether there is a noteworthy increase in prescription rate over the three years and, if not, to bring this non-adherence to the attention of Beaumont Health so it may better align its prescription conventions with those recommended by the AHA and ACC.

## METHODS

This is a retrospective study using the medical records of 5000 patients admitted to Beaumont Health with non-ST-segment elevation myocardial infarction (NSTEMI) from September 13, 2014 to September 13, 2017. Patients included in this study will have a primary admission diagnosis of NSTEMI with elevated troponin, with no antiplatelet medication use prior to admission, who underwent percutaneous coronary intervention (PCI). Two study groups will be compared: the September 2014-February 2016 preliminary study group and the March 2016-September 2017 final study group.

## ANTICIPATED RESULTS

It has already been established that 14% of patients were prescribed ticagrelor within the preliminary study group, while further analyses must be undertaken at the study's completion in September 2017 to calculate the ticagrelor prescription rate of the final study group. The final group is expected to exhibit either a similar prescription rate or an otherwise unremarkable increase.

## CONCLUSION

The results are expected to support the hypothesis that there is still a significant number of Beaumont physicians that have yet to appropriately adhere to the 2014 AHA/ACC ticagrelor guideline.

# Assessing Non-Palliative Care Hospitalists' and Nurses' Attitudes Towards Palliative Care

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## INTRODUCTION

Palliative care is an expanding field that aims to tailor health care to the specific patient, usually those diagnosed with serious or chronic illnesses, and takes into account the patient's psychosocial, spiritual, and physical needs. Palliative care is underutilized due to a multitude of barriers, systemic and institutional, such as personnel availability, the culture of an institution, and the specific patient population. This particular study looks at how non-palliative care hospitalists and nurses view palliative care, in order to determine the barriers to implementing palliative care.

## METHODS

A survey will be distributed to non-palliative care hospitalists and nurses at Beaumont Troy hospital. The survey will be done through an email sent out with a Qualtrics survey link. The survey will contain both multiple choice questions and open ended questions that aim to understand the views on palliative care and what the potential obstacles are to implementing palliative care.

## ANTICIPATED RESULTS

It is expected that participants will show a range of different perspectives on palliative care. It is postulated that some may be unsure about what of palliative care is and when to use it. Some anticipated barriers include the belief that palliative care is equivalent to hospice care, lack of resources to fulfill all palliative care consult requests, and a culture more focused on curative measures rather than palliative ones. It is also anticipated that physicians and nurses may offer differing views on palliative care that could be communicated to each other in the future.

## CONCLUSION

The results are expected to support the hypothesis that there will be distinct barriers to palliative care use at Beaumont Troy hospital. It is also expected that through the survey, some of these barriers will be specific enough, such that the hospital personnel may use this information to improve patient care.

# Muscles: The Strings of the Wrist Puppet

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## INTRODUCTION

Traditionally, medical schools and medical texts take a structural approach to teaching anatomy; this is particularly true for the study of the muscles. These approaches generally present the muscles in terms of layers and compartments. This method, despite its effectiveness, may not be the best approach for all students. Many students seem to find clearer understanding after being taught the functional aspects of the muscles when their initial exposure is linked more strongly to clinically relevant functions. This study attempts to elucidate the differences on the understanding of human forearm anatomy, if any, between a traditional layer-based approach and a function-based approach.

## METHODS

First- and second-year medical students at the Oakland University William Beaumont School of Medicine have been invited to participate in the study and will be divided into traditional and functional groups based on birth month. Both groups will be directed to an online module hosted on SoftChalk with identical pre- and post-test data collected utilizing Qualtrics. The traditional group will be exposed to layer-based anatomy of the forearm, while the functional group will be presented a function-based approach to the same anatomy. After taking the post-test, students will be invited to complete an optional survey. Once obtained, scores between groups will be analyzed using a 2-Sample T-Test and within groups using a Paired T-Test.

## ANTICIPATED RESULTS

Compared to the traditional group, the functional group is anticipated to demonstrate an increase in score from the pre-test to the post-test or perform as well as the control group. Further, the functional group may reflect more positively upon the module given the non-traditional approach.

## CONCLUSION

The expected results will support the notion that novel, clinically-relevant approaches to anatomy education may benefit students and enhance retention of material. Ideally, such results will encourage medical educators to explore alternative teaching methods to best serve their students.

# An Evaluation of Bladder and Bowel Symptom Improvement Using Validated Questionnaires in Patients Undergoing Percutaneous Tibial Nerve Stimulation in a Busy Urology Practice

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## INTRODUCTION

Percutaneous tibial nerve stimulation (PTNS) is an FDA-approved, minimally invasive treatment method for overactive bladder (OAB). Real-world outcomes of PTNS are undefined in community-based practices. We explored bladder and bowel symptom outcomes with PTNS using validated questionnaires in this practice setting.

## METHODS

Adults undergoing PTNS treatment in a large urology practice between November 2015 and January 2017 completed the St. Marks Fecal Incontinence Grading System, Nocturia Quality of Life (NQOL), Overactive Bladder Questionnaire Short Form (OABq-SF), Overactive Bladder Questionnaire Health-Related Quality of Life (OABq-HRQOL), Colorectal-Anal Distress Inventory-8 (CRADI-8), and Urogenital Distress Inventory-6 (UDI-6) during weekly treatments at three time intervals: visits 1-2 (baseline), 5-7 (midpoint), and 9-12 (treatment end). Demographics and other treatment related data were collected and analyzed with descriptive statistics.

## RESULTS

Of 142 patients reviewed, 47 (33.1%) patients (mean age 71 years, 59.6% female) completed at least one questionnaire. 22% of questionnaire responders vs. 42% of non-responders completed PTNS treatment ( $p=0.021$ ). Although there were too few questionnaires to evaluate for statistically significant changes at specific time intervals, median scores showed improvement from baseline to mid treatment (not shown) and to treatment end as follows: a) St. Marks (6 to 2.5;  $n=6$ ), b) NQOL sleep energy (13 to 18;  $n=4$ ), NQOL bother (12 to 14;  $n=5$ ), c) OABq-SF (60 to 40;  $n=6$ ), d) OABq-HRQOL (53.33 to 78.33;  $n=9$ ), e) CRADI-8 (8.26 to 7.81;  $n=8$ ), and f) UDI-6 (45.42 to 31.25;  $n=8$ ).

## CONCLUSION

Bladder and bowel symptoms showed improvement on all validated questionnaires. This started at treatment midpoint and persisted to treatment end. More research is needed in larger samples to evaluate whether trends are statistically significant.

# Assessing the Effects of Massage Therapy Post-Mastectomy: A Pilot Study

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## INTRODUCTION

Breast cancer is the most common cancer in women of all ethnicities in the United States; effecting 1 in 8 women in their lifetimes. Breast Cancer is a complex disease requiring emotionally and physically demanding therapies for treatment. Beaumont Health's Integrative Medicine department offers clinical massage therapy that specifically targets fibrosis, lymphatic edema, and neuropathy individualized to each patient to reduce these symptoms while helping them reconnect with their bodies after the mental and physical trauma of diagnosis and treatment of breast cancer. This pilot study aims to assess the effectiveness of 5 sessions individualized clinical massage therapy over 8 weeks on quality of life and clinically measured range of motion in flexion, extension, abduction, and external rotation in women having undergone unilateral mastectomy within 2 years of enrolling in the study.

## METHODS

We seek enroll 39 mastectomy patients with the goal of 30 patients fully completing the study. The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire 30 (EORTC QLQ-30) will be administered prior to the first session and after the fifth session. The Licensed Massage Therapist will evaluate the range of motion before each massage treatment and after the final treatment. Change in scores will be computed for each of the quality of life and range of motion measures and they will be analyzed with a one-sample t-test. Descriptive statistics will be presented as mean±SD.

## ANTICIPATED RESULTS

Compared to the control group, the treatment group is expected to exhibit an improvement in quality of life based on EORTC QLQ-30 scores and an increased range of motion on the affected side.

## CONCLUSION

The results are expected to support the hypothesis that 5 sessions of clinical massage therapy will provide benefits to women having undergone mastectomy in improving quality of life and range of motion.

# Hemorrhagic Complications in Patients Receiving Direct Oral Anticoagulant Therapy

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## INTRODUCTION

Dabigatran, apixaban, and rivaroxaban are direct oral anticoagulants (DOACs) recently approved for use in venous thromboembolism (VTE); however, therapy-induced hemorrhage remains a major complication in patients. This study retrospectively reviews the hemorrhagic complications associated with DOACs and compares the hemorrhagic risk amongst the three DOAC medications in post-clinical trial general practice.

## METHODS

The electronic medical charts of 2255 patients with prolonged PTT tests during August 2015 to April 2016 at William Beaumont Health System – Troy were retrospectively reviewed. Patients with prolonged PTT and simultaneously receiving DOACs were identified. Hemorrhagic complications associated with DOAC therapy were analyzed.

## RESULTS

517 (22.9%) of the 2255 patients with prolonged PTT tests were identified as receiving DOAC therapy. Group A had 217 patients receiving apixaban; Group B had 43 patients receiving dabigatran; and Group C had 257 patients receiving rivaroxaban. The hemorrhagic incidence was 8.8% (19/217) in group A; 27.9% (12/43) in group B; and 21.0% (54/257) in group C. Overall, GI bleeding was the most commonly recorded hemorrhagic complication (39.1%), followed by hematuria (16.3%), epistaxis (16.3%), bruises (12.0%), others (8.7%), and hematoma (7.60%). Additionally, GI bleeding was the cause of all clinically significant anemias (13 patients), requiring discontinuation of DOAC therapy and occasional blood transfusions. The incidence of GI bleeding in patients receiving dabigatran (18.6%) was significantly higher than both apixaban and rivaroxaban ( $p < 0.05$ ). However, there was no significant difference in GI bleeding incidence between apixaban and rivaroxaban.

## CONCLUSION

Apixaban had the lowest incidence of hemorrhagic complications amongst the three medications. GI bleeding was the most common and clinically significant complication; thus, routine screening for GI bleeding in patients receiving DOAC therapy with prolonged PTT is encouraged. Apixaban may be an alternative treatment for patients with non-GI related hemorrhagic complication while receiving rivaroxaban or dabigatran. However, this practice may be questionable in patients with GI bleeding.

# Neuromodulation for Chronic Urogenital Pain: Comparison of Pudendal and Sacral Nerve Stimulation

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## INTRODUCTION

Little evidence exists regarding the effect of chronic neuromodulation on urogenital pain. Sacral neuromodulation has been shown to improve pelvic pain, and pudendal neuromodulation as an alternative to those who fail sacral neuromodulation. The primary purpose of this study was to compare outcomes regarding pain scores and bladder symptoms between pudendal vs. sacral nerve modulation.

## METHODS

Adults in our prospective database with primary/secondary diagnosis of pelvic pain (excluding interstitial cystitis) and undergoing pudendal or sacral neuromodulation were reviewed. History, pain scores, Global Response Assessment (GRA), Interstitial Cystitis Symptom/Problem Index (ICSUPI) and Overactive Bladder symptom severity (OABq ss)/health related quality of life (HRQOL) measures were analyzed with descriptive statistics and repeated measures over 1 year.

## RESULTS

87 had a lead placed and 72 (83%) had generator implantation. 37/65 that had complete baseline data had a pudendal (12/37 had failed sacral stimulation) and 28 had a sacral lead. Group characteristics were similar except for the pudendal group had fewer with primary urinary urgency/frequency (8.1% vs. 39.3%;  $p=0.003$ ). Although a higher proportion of pudendal patients had a primary diagnosis of pelvic pain, this was not statistically significantly (62.2% vs. 38.5%;  $p=0.06$ ). Median pelvic pain scores were similar between pudendal/sacral groups at baseline and each follow up, and both improved significantly over 1 year ( $p=0.0003$  and  $p<0.0001$ ). The pudendal group had lower ICSUPI and OABq/ss scores at baseline ( $p=0.007$  and  $p=0.035$ , respectively), but both groups improved over 1 year on the ICSUPI ( $p<0.0001$  for both groups), OABq/ss ( $p=0.005$  and  $p=0.0002$  respectively), and OABq HRQOL ( $p=0.027$  and  $p<0.0001$  respectively).

## CONCLUSION

Both groups experienced modest but similar improvements in pelvic pain. Pudendal neuromodulation was effective in those who failed sacral neuromodulation and was used preferentially in patients with a primary diagnosis of pain. Neuromodulation should be considered in the management of chronic pelvic pain.



# Identifying Predictors of Self-Discharge: An Analysis of Patients Who Leave Against Medical Advice

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## INTRODUCTION

Providing high quality care is a challenge when patients do not adhere to physician recommendations. Patients who leave the hospital against medical advice (AMA) present an extreme example of non-adherence, and this situation creates high potential for errors in care and undesirable medical outcomes. The Beaumont Health system does not explicitly track discharges AMA (DAMA), and so the extent and outcomes faced by AMA-discharged patients remain unclear. The primary goal of this study is to recognize socio-demographic variables associated with DAMA at Beaumont Hospital, Royal Oak. A secondary goal is to enumerate a baseline of DAMA cases and readmission rates. Comparison with national and institutional data can help determine needs for future study and interventions for AMA discharge protocol and prevention at Beaumont.

## METHODS

This retrospective chart review utilized data from the Epic electronic medical record to examine the major characteristics, risk factors, and outcomes of the 400 DAMA records from Beaumont Hospital, Royal Oak campus in the year 2015. Key variables collected include patient demographics, admission and discharge information, patient diagnoses and procedural data of each encounter. These data were subsequently organized for analysis.

## ANTICIPATED RESULTS

Data indicate that 0.72% of total inpatient discharges from Beaumont Royal Oak in the year 2015 were AMA. It is expected that these patients who left AMA display unique demographic and hospital admission characteristics. Enumeration of DAMA cases and readmission rates is projected to be similar to institutions of comparable size. Anticipated socio-economic risk factors for DAMA include male sex, patients with previous DAMA, and patients with history of psychiatric illness and/or substance abuse.

## CONCLUSION

The results of this study have the potential to assist with developing measures to decrease DAMA occurrence, thereby improving health outcomes and the way in which health services are delivered to adult inpatients at Beaumont Royal Oak.

# Toxicity Profiles Following Whole Breast Irradiation plus Sequential Boost using Hypofractionated or Conventionally Fractionated Treatment

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## INTRODUCTION

To compare toxicity and cosmesis in women with early-stage breast cancer treated with conventionally fractionated (C-WB) or hypofractionated (H-WB) whole breast irradiation with sequential boost.

## METHODS

We performed a matched-pair analysis to compare patients treated with C-WB or H-WB as part of BCT at a single institution from 2008-2016. 240 patients (120 pairs) were matched by age (+/- 3 y), T-stage, chemotherapy (y/n), and endocrine therapy (y/n). Acute ( $\leq 6$  mos post-WB) and chronic ( $> 6$  mos post-WB) toxicities were graded according to CTCAEv3.0. Cosmesis was evaluated using the Harvard cosmesis scale. Outcomes were analyzed using t-tests for continuous variables,  $\chi^2$  for categorical variables, and Kaplan-Meier estimates. P-values  $< 0.05$  were considered significant.

## RESULTS

Median follow up for all patients was 2.6y (0.1-28.1); 1.1 and 6.3y for H-WB and C-WB, respectively ( $p < 0.001$ ). Median age at diagnosis was 61 (44-88). 84% and 12% of patients received anti-hormone and chemotherapy, respectively. There were no differences in race, menopausal status, histology, or grade. The H-WB group had more close margins ( $< 2$  mm; 32 v 4%,  $p < 0.001$ ). There were no differences in acute toxicity between H-WB and C-WB. Rates of grade 2/3 acute toxicity were  $< 10\%$  overall, with the exception of hyperpigmentation (15%). Rates of chronic toxicity were similar, with low rates of grade 2/3 toxicities ( $< 12\%$ ). Cosmesis was good/excellent in 93% of patients, with no differences in the acute period. There were more H-WB patients with fair/poor chronic cosmesis (13 v 3%,  $p = 0.026$ ). Clinical outcomes were excellent at 3 years and similar between H-WB and C-WB.

## CONCLUSION

Patients had favorable toxicity profiles regardless of fractionation schedule used. In light of recently published data supporting favorable toxicity and cosmesis with hypofractionated regimens, we are evaluating specific dosimetric or patient related features that may contribute to the small difference in chronic cosmetic outcomes when comparing groups.

# Sports-Related Concussion Knowledge and Attitudes of Intramural and Club Sport Athletes

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## INTRODUCTION

Sports-related concussions have garnered greater public health concern as their incidence rises, leading to changes in concussion education and laws to protect athletes. Currently the intramural and club sport programs at Oakland University do not have a formal concussion education program for its athletes. Therefore, it is desired to determine the knowledge and attitudes these athletes have towards concussions to determine whether such a program is needed. We hypothesized that due to the lack of a concussion education program the athletes do not possess adequate knowledge and harbor unhealthy attitudes towards concussions.

## METHODS

A validated and reliable concussion knowledge and attitudes survey was identified, adapted, and emailed to athletes participating in intramural and club sports at Oakland University. The responses generated two scores: concussion knowledge and attitude. T-tests were used to evaluate for statistical significance between scores for different groups.

## RESULTS

182 of 200 respondents had valid 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. The mean overall knowledge and attitude scores were 80.6% and 74.8%, respectively. These scores did not vary by sport participation ( $p=0.532$ ;  $p=0.513$ ). Female athletes had significantly higher knowledge scores than male athletes ( $p=0.011$ ), but similar attitude scores ( $p=0.072$ ). Athletes majoring in health science fields had significantly higher knowledge scores than athletes in non-health science majors ( $p=0.006$ ), but similar attitude scores ( $p=0.697$ ).

## CONCLUSION

While knowledge was above average and attitudes were average, there is room for improvement that could be met with a single concussion education program for both intramural and club sport athletes. Despite having significantly higher knowledge, health science athletes did not display healthier attitudes than non-health science athletes, suggesting that knowledge does not always confer healthier attitudes. Therefore, a concussion education program should emphasize improving athlete concussion attitudes.

# A Pilot Study to Investigate the Neuropsychological Effects of Binaural Beats on the Human Brain

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## 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 stimuli 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.

# Investigating Trends in Lymph Node Counts in Colectomies Done for Colonic Adenocarcinomas: A Pilot Study

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## INTRODUCTION

An accurate lymph node (LN) count (used to stage colon cancers) means making sure that enough nodes are sampled. Current national guidelines necessitate evaluating a minimum of 12 lymph nodes for adequate tumor staging. We have noticed decreasing lymph node counts found in specimens at Beaumont RO. This poses the question of whether the resultant tumor staging of these cases is adequate and accurately predicts patient outcomes. We will examine this trend's characteristics, and see if it they correlate with changes in surgical practice, such as switching from open to laparoscopic colectomy. Specifically, we have the following objectives:

- 1) Definitely establish this trend exists
- 2) Correlate reduced LN counts with smaller resection sizes, (e.g. those from laparoscopic surgeries)
- 3) Investigate if catching earlier stage cancers lowers LN counts
- 4) Compare LN yields from residents and Pathology Assistants (PA's)

## METHODS

We will examine 1000 colectomy cases, sorting the data into: open vs. laparoscopic procedures, resection sizes, tumor stages, and if either a PA or resident performed the gross examination. We will also be examining patient demographics, treatments given, and overall prognoses. We will examine LN count in relation to these categories.

## ANTICIPATED RESULTS

We believe smaller resections correlate with lower LN counts. We also anticipate that laparoscopic procedures will yield fewer LN's. By comparing node yields between residents and PA's, we also hope to account for any discrepancies we might find between these two groups.

## CONCLUSION

We hope to determine if this trend can be corrected, or if alternative causes must be explored. If laparoscopic surgeries yield, on average, fewer LN yields, then the current standard must be reexamined. We believe the LN count is dependent on a myriad of factors, and work must be done to look into what constitutes an appropriate number of examined LN's per resection sample.

# Improving Medical Student understanding of Young Adults with High-Functioning Autism Spectrum Disorder

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## INTRODUCTION

This study aims to determine if an online educational module about autism spectrum disorder (ASD) and the challenges that young adults with ASD encounter while seeking healthcare will increase medical students' awareness of this issue. By seeing potential accommodations, medical students may consider incorporating them into their future practice. The hypothesis is that students who use this educational module will have improved knowledge and awareness of the difficulties facing young adults with ASD, as measured by the pre and post survey questionnaires.

## METHODS

All Class of 2019 and 2020 medical students at OUWB were sent an email to participate in the study. The SoftChalk module contained a pre survey, educational content, and a post survey. All students that participated took the identical pre and post survey, consisting of eight multiple-choice questions. The post survey also included an additional comments section for further qualitative assessment and feedback. A paired t-test was used to compare the pre and post survey questions for all responses. Statistical significance was set at 5%. Students served as their own controls for the pre and post survey questions.

## RESULTS

The majority of students increased their score after taking the module (39 out of 44, or 86.7%). 5 students showed no change in score. The average score on the post survey increased by 1.8 points, which equates to a 22.6% increase. The t-test showed a p value <0.0001. The qualitative comments section indicated that students were concerned about the feasibility of accommodating those with ASD, but saw the value in doing so.

## CONCLUSION

Findings suggest that a module tailored for medical students can increase their awareness and knowledge regarding the needs of young adults with ASD.

# Quality of Life of Patients Undergoing Prostatectomy Based on Treatment Delay

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## INTRODUCTION

This project will evaluate three prostatectomy surgical methods all performed in one hospital by a team of surgeons. It is important to continually evaluate prostatectomy outcomes in a variety of clinical settings in order to ensure that maximum quality of life post-surgery is achieved. This study will improve clinical practice by showing how satisfied patients are with surveillance versus surgical intervention at a range of prostate cancer grades (Gleason scores). With this knowledge, clinicians can better advise patients with different Gleason scores on the best treatment option for them. In this way, clinicians can better advise patients in cases of low-risk prostate cancer. This study seeks to answer the question of whether watchful waiting positively or negatively impacts patients with different Gleason Scores. We hypothesize that quality of life outcomes will be better at lower cancer grades with the surveillance approach.

## METHODS

Data for three different surgical methods (open retropubic, open perineal, and robotic prostatectomy) will be evaluated. Risk variables will include age, race, Gleason Score, and treatment delay (timespan from diagnosis to intervention). Quality of life variables will include urinary function and sexual function. Pre-surgical quality of life variables will be compared to post-surgical quality of life variables. For each treatment group, mean pre-surgery and post-surgery variables will be analyzed. This data will show how treatment delay affects patient satisfaction at a range of Gleason Scores. Post-surgical data will be examined up to two years post-surgery.

## ANTICIPATED RESULTS

We hypothesize that quality of life outcomes will be better with treatment delay in cases of low-risk, localized prostate cancer.

## CONCLUSION

The results are expected to support the hypothesis that surveillance will prove to be the best treatment decision for certain patients with low-risk prostate cancer.

# **Culturally Competent, Faith-Based tools to Promote Awareness of Postpartum Depression in Muslim Women**

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## **INTRODUCTION**

This project seeks to conduct a knowledge, attitudes, and behavior assessment on adult-aged self-identifying Muslim mothers on the topic of women's healthcare, with an emphasis on postpartum depression (PPD). Muslim women visit the gynecologist, on average, less often than is medically recommended. They are also less likely to seek medical help when experiencing emotional difficulties during and after pregnancy. This may be due to different explanations for the symptoms such as supernatural causes or a lack of faith. This project seeks to understand why Muslim mothers do not seek medical care as readily and whether perspectives on stigmatized topics, such as PPD, can be changed through culturally sensitive education. There is no study that evaluates attitude changes about PPD through education within this group.

## **METHODS**

10 Muslim women from South East Michigan will be interviewed for 30 minutes. At the start of the interview, the participants will be asked several directed questions about their demographic background. At the conclusion of the semi-constructed interview, the participants are given a culturally competent faith-based brochure about PPD to take home. They were then emailed a post-interview survey to evaluate any changes in knowledge and attitude about PPD.

## **ANTICIPATED RESULTS**

After using the culturally sensitive faith-based brochure on PPD, the participants are expected to have a better understanding of the health recommendations in identifying and treating PPD. We further expect that the paralleling faith recommendations will reinforce positive health seeking behaviors. It is expected that Muslim women will express a desire for more faith-sensitive health care tools.

## **CONCLUSION**

The results are expected to support the hypothesis that the use of culturally competent faith-based educational tools are an effective tool to build awareness and understanding of gynecological care issues within the community of Muslim women.



# Dialogical Narrative Approach to Enhance Analytical Thinking and Student Engagement During Lecture-Based Classes

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## INTRODUCTION

The Dialogical Narrative approach (DN) is an interactive teaching method designed to teach physiology for health professional students during didactic lectures. The DN lecture integrates an interactive conversational style within a story-telling, or 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. 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 the teacher's PowerPoint slides, and were encouraged to review the material beforehand. During the lecture, the instructor guided the students through the material using story-telling and question-answer conversational styles. Focus group sessions were conducted in order to determine the students' perceptions of the effectiveness of the teaching approach.

## RESULTS

Following a physiology lecture implementing the DN approach, two focus group sessions each consisting of seven second-year medical students were conducted. Sessions were recorded and analyzed for student-perceived effectiveness and qualitative-thematic analysis was performed on the recordings. Analysis has revealed that most students found the DN approach more engaging and conducive to active participation than traditional didactic lectures. Students also perceived enhanced critical thinking of the lectured material and dialogues shared between their instructor and colleagues.

## CONCLUSION

The DN approach is an alternative teaching method that can be implemented during lectures to promote student engagement, active learning, and teach physiological concepts more effectively, as perceived by medical students when compared to traditional didactic lectures. Analysis has revealed that although there is a sharp divide among students who feel comfortable with active participation and open dialogue in front of the class, most students believe that these interactions foster skills that are essential for their success.

# Post-transplant Hypertension: A Predictor of Kidney Transplant Outcomes

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## **INTRODUCTION**

Kidney transplants are the treatment of choice for suitable end-stage renal disease patients, resulting in restoration of improved or normalized renal function from a functioning renal allograft. Hypertension commonly remains in pre-transplant hypertensive patients or occurs in pre-transplant normotensive patients after successful kidney transplantation. Post-transplant hypertension can lead to poor kidney transplant outcomes especially renal allograft survival, patient survival, and cardiovascular morbidities and mortalities. However, the association between early post-transplant hypertension (within 2 months) and kidney transplant outcomes is limited. The goal of this study is to determine the potential effect of early post-transplant hypertension as a predictor of post-transplant outcomes.

## **METHODS**

Kidney transplant recipients at Beaumont Hospital from January 2008 through to August 2016 will be divided into 2 groups based on early post-transplant blood pressure: < 140 mmHg and > 140 mmHg. This baseline blood pressure will then be correlated with post-transplant outcomes including renal allograft function (serum creatinine and eGFR at 3, 6, 9, and 12 months post-transplant), incidence of re-hospitalization, patient survival, and major cardiovascular events.

## **ANTICIPATED RESULTS**

Compared to the control group, patients with early post-transplant hypertension are expected to exhibit decreased renal allograft function and patient survival. Patients with early post-transplant hypertension are also expected to exhibit increased incidence of re-hospitalization and cardiovascular events.

## **CONCLUSION**

The results are expected to support the hypothesis that early post-transplant hypertension may lead to decreased kidney transplant outcomes. This correlation can then warrant more aggressive treatment of early hypertension and may lead to changes in the selection criteria for transplant recipients in an attempt to generate more effective post-transplant outcomes.

# Chemotherapy-Induced Neuropathy Impact on Quality of Life in Breast Cancer Survivors

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## INTRODUCTION

In the US, there are nearly 3 million survivors of breast cancer. The increase in survivorship necessitates a focus on quality of life (QOL) for breast cancer survivors. A major factor that has been implicated in decreased QOL in cancer survivors is chemotherapy induced peripheral neuropathy (CIPN), which is a known side effect of taxanes, a group of chemotherapy drugs commonly used in the treatment of breast cancer. This study aims to address the critical need to understand the prevalence, duration and impact on QOL of CIPN in breast cancer survivors.

## METHODS

3524 individuals diagnosed with breast cancer from 2004-2014 were emailed the EORTC QLQ Chemotherapy-Induced Peripheral Neuropathy 20 (CIPN20) Questionnaire and the European Organisation for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire (QLQ) C30. The responses from the questionnaires were then paired to information from the participant's medical record.

## RESULTS

828 individuals completed the surveys. The prevalence of CIPN and duration will be calculated using appropriate statistical methods. The surveys will be scored using to appropriate scoring criteria and compared to determine CIPN impact on QOL. Additional demographic factors will be analyzed to determine any associated factors. It is hypothesized that individuals who received chemotherapy will report higher scores on CIPN20 Questionnaire than individuals who did not receive chemotherapy.

## CONCLUSION

Physicians and patients can use the information gained from this study to make clinical decisions for treatment. It can also be used as a guide to understand the risk, duration and implications of CIPN after completion of chemotherapy. This study is aligned with the future of medicine focused on patient reported outcomes, personalized medicine and improving long-term health status. Ultimately, it will provide vital information in developing treatment for the person, not just the cancer.

# Exploring How Physicians Spend Time in Electronic Medical Records

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## INTRODUCTION

This project aims to quantify the usage of the electronic medical record (EMR) by residents and attending physicians at Beaumont hospital in order to gain insight into how physicians apportion their time spent in the EMR. The usage will be compared between the two groups. This will contribute to the minimal knowledge that exists of EMR use in terms of time spent using the system and may highlight areas for future improvement for the EMR system at Beaumont.

## METHODS

Data on the EMR use of a group of residents and attending physicians will be pulled from the logs of EMR usage data stored by the IT department at Beaumont hospital. This data will be summarized and the average total time spent per day in the EMR and the average total time spent on specific sections of the EMR per day will be calculated. An overall average (for total time spent and for time per section) for residents and an overall average for attending physicians will be determined. The averages will be compared between both groups using a t-test.

## ANTICIPATED RESULTS

EMR usage data for approximately twenty-seven residents and twenty-seven attending physicians over a month's time from an internal medicine floor will be used for the data analysis. It is anticipated that the average time spent in the EMR (both total and per section) will be greater for residents than attending physicians due to less experience with the system and the fact that the attending physicians often take more of a supervisory role.

## CONCLUSION

Opportunities for improvement to the EMR system may be highlighted based on the discovered patterns of usage by physicians or differences between resident and attending physician usage.

# Assessing Perceived Life Satisfaction of OUWB students in the Context of Empathy and Future Patient Care

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## INTRODUCTION

Emerging adulthood is a period of life where individuals attain the independence and status of adulthood without many of the full-fledged responsibilities that accompany it. It is often characterized as an age of instability, identity exploration, self-focus, and feeling “in between.” The challenges emerging adults encounter often negatively impact their mental status and levels of life satisfaction. These challenges are only increased in severity for medical students, the majority of whom are emerging adults. We would like to explore these challenges, in the context of life satisfaction and patient empathy, for OUWB School of Medicine students in their pre-clinical vs. clinical years

## METHODS

Data will be collected by utilizing two standardized Qualtrics assessments, completed by students in all four years of the OUWB curriculum. The assessments will ask subjects to rank, on a 7-point Likert Scale, how well they identify with a number of statements used to evaluate their perceived levels of life satisfaction. Example statements include: “I would describe my satisfaction with my social life as (1-7)” and “Patients feel better when their feelings are understood by their physicians.” The two assessments are based on a Life Satisfaction index and the Jefferson Scale of Physician Empathy index.

## ANTICIPATED RESULTS

We predict that a significant portion of OUWB medical students will report decreased levels of life satisfaction and empathy for patients, especially among students in their clinical years of the curriculum. We also predict that a positive correlation exists between the degree of self-reported life satisfaction among students and their levels of empathy toward patients.

## CONCLUSIONS

These results are expected to produce a better understanding of the relationship between life satisfaction and empathy toward patients in OUWB medical students. Ultimately, the results of the assessments can assist in devising revisions intended on improving life satisfaction outcomes for OUWB students.

# Patient Compliance with Percutaneous Tibial Nerve Stimulation in a Large Community-Based Practice

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## INTRODUCTION

Percutaneous tibial nerve stimulation (PTNS) is a treatment used for refractory overactive bladder (OAB). The protocol for PTNS includes using a battery-powered stimulator and needle electrode to stimulate the tibial nerve weekly for twelve weeks followed by monthly maintenance. Clinical trials have shown that these patients have sustained improvements in symptoms. However, currently, very little “real-world” data exists on the compliance of patients. The purpose of this study is to determine if patients are following treatment guidelines.

## METHODS

A retrospective chart review of PTNS patients at a large urology practice between 2012 and 2017 was conducted. Demographics, medical history, symptom changes, and reasons for nonadherence to treatment were evaluated with descriptive statistics.

## RESULTS

142 patients (82 females; mean 73 years old) underwent PTNS. 85% of patients had OAB with urinary incontinence and 86% reported nocturia. Prior to starting PTNS, 88% had previous anticholinergic treatment (79/114 (69%) tried 1 or 2) and 65/141 (46%) had used Mirabegron. After starting PTNS, 92/122 (75%) were improved at 6 weeks and 116/127 (91%) were improved at 12 weeks. 81% of patients completed all 12 weekly PTNS treatments. Reasons for missing a treatment or not completing all 12 treatments included personal reasons (7/14), lack of improvement (4/14), improved symptoms (2/14), and uncomfortable stimulation (1/14). 78% of patients continued to have a median of 5 (1-35) maintenance treatments. Reasons for not going to maintenance every month or discontinuing maintenance completely were lack of improvement (22/36), relocation (9/36), cost (4/36) and one developed other pelvic floor symptoms. Of the 22% that did not have any maintenance, 7/22 (32%) reported no improvement at 12 weeks.

## CONCLUSION

The majority of patients were compliant with the weekly PTNS treatments and reported improvement in symptoms. The most common reason for not continuing maintenance was little/no improvement of symptoms.

# Water Quality, Breast Feeding Practices and Infant Mortality in Rural Guatemala

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## INTRODUCTION

By some estimates, the infant mortality rate in Guatemala may be up to 8 times that of the US. The WHO indicates diarrheal illness as a leading cause of infant death in developing countries. This pilot study is to evaluate water sources of rural villages in Guatemala and determine the relationship between location, breast feeding practices, water quality, and infant mortality. A secondary goal is to determine if there is a difference in individual access to healthcare providers and if that has any relationship to infant mortality.

## METHODS

Women between 18 and 40 from villages in Nueva Eden will be given a questionnaire that asks about number of pregnancies and surviving children, location, water filters, access to healthcare, and breast feeding. A water sample will also be collected and analyzed for metal and bacterial content. Samples positive for bacteria will be shipped back to OU and evaluated for specific species using PCR.

## ANTICIPATED RESULTS

Women who consistently breastfeed and do not use any supplemental foods will have a lower incidence of infant mortality compared to those who use supplemental foods. Increased risk for mortality might include high bacterial or heavy metal content of water, less consistent filter use, and lack of healthcare access.

## CONCLUSION

The results are expected to demonstrate an inverse relationship between consistent, exclusive breast feeding practices and infant mortality. It is also expected that there will be lower rates of infant mortality in families that consistently use water filters and that have water with lower bacterial and heavy metal content.

# Diversity of Donors' Bodies in Medical School Body Donation Programs

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## **INTRODUCTION**

Within Anatomy Departments, there has been a casual observation that there is a disproportionate number of white donor bodies compared to other minority groups. However, there are few demographic studies to back up this impression. The primary goal of this research project is to collect data on the demographics of race, sex and age of donor's bodies in body donation programs in the Great Lakes region.

## **METHODS**

We will contact body donation programs in the Great Lakes region to gather information on the demographics of whole body donations in the past 3-5 years (depending on how far back they have records). We will then compare the collected demographics of the donors to the state census data of the surrounding area and look for any correlations.

## **ANTICIPATED RESULTS**

Based upon our casual observations we expect that white donors will be overrepresented in the donor pool when compared to the racial distribution of the local population at each donor site.

## **CONCLUSION**

We anticipate collecting donor information from at least 5 medical school whole body donation programs. Comparisons of the donor demographics at each school with the surrounding areas will allow us to determine if the perceived overrepresentation of white donors is accurate.



# Efficacy of Physical Therapy in the Treatment of Female Pelvic Pain

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## INTRODUCTION

Female pelvic pain is a potentially debilitating symptom of an often-unknown etiology. Treatment of pelvic pain has proven to be difficult due to the variance in etiology, treatment methods, and outcomes. Current treatments range from medication management and nerve blocks to surgical intervention, both with little proven effect. Pelvic floor physical therapy (PFPT) has been suggested as a treatment option, but clinical evidence of its efficacy is currently lacking and therefore, it is not widely used at this time. It is our hypothesis that pelvic floor physical therapy will prove to be effective in the treatment of pelvic pain.

## METHODS

A retrospective chart review was performed for women with a primary diagnosis of pelvic pain who presented to a multidisciplinary clinic for PFPT in 2015. Data reviewed included pertinent history, initial and post-treatment scores for validated questionnaires [Pelvic Floor Distress Inventory Questionnaire (PFDI) and the Pelvic Floor Impact Questionnaire (PFIQ)], and patient-reported pain levels.

## RESULTS

208 females underwent PFPT for primary indication of pelvic pain in 2015. Mean age was 45 yr  $\pm$  15. Mean number of visits was 9.3  $\pm$  6.7. Pre and post treatment PFDI and PFIQ questionnaires were completed by 90/208 (43%) and 88/208 (42%) women respectively. Post treatment PFDI and PFIQ scores decreased by 33 and 51 points respectively, and were statistically significant ( $p < 0.0001$ ). PFDI did not meet the minimum important difference. Mean pain level decreased from 4.6 to 2.2 by the last visit ( $p < 0.0001$ ).

## CONCLUSION

PFPT is an excellent, non-invasive treatment for women presenting with pelvic floor complaints, including pelvic pain. The potential benefits of PFPT far outweigh associated risks, and may help avoid more risky treatments such as pain medications, nerve blocks, and surgery.

# National Variation in the Management of Extraperitoneal Bladder Ruptures

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## INTRODUCTION

Genitourinary trauma is a relatively rare occurrence, and only makes up 0.46-1.5% of all trauma admissions. Within the broad scope of genitourinary trauma, bladder injuries only amount to about 10% of the total cases. Extraperitoneal bladder ruptures involve rupturing or tearing of the sides or bottom of the bladder and subsequent leakage of urine into the pelvic cavity. Extraperitoneal ruptures account for approximately two thirds of all bladder injuries. Due to the rarity of genitourinary trauma, and even more so bladder injuries, there is a lot of disparity in the literature regarding evaluation and management techniques. Therefore, our goal was to analyze national trends in extraperitoneal bladder injury management and the resulting outcomes to help determine the best practices.

## METHODS

Patients from participating institutions from who suffered extraperitoneal bladder injuries with an American Association for the Surgery of Trauma (AAST) grade greater than or equal to 2 since 2015 will be identified from the AAST trauma database. Data will be analyzed to compare the post-injury leak rates following either operative repair or catheter drainage to heal bladder injuries.

## ANTICIPATED RESULTS

Compared to patients who receive surgical repair of their bladder injuries, the patients treated with conservative catheter drainage will have lower post-injury urine leak rates and complication rates.

## CONCLUSION

The results are expected to support the hypothesis that conservative management of extraperitoneal bladder ruptures will result in better outcomes for patients. The results can be used to support guidelines regarding the treatment of patients presenting with extraperitoneal bladder trauma.

# Effects of Streamlining Consultation and Maintaining Hospital Bed Availability on Trauma Admission

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## 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, simple, and affordable 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 communications intervention affects the time from "Arrival to EC" to "Consult Placed," whereas the bed placement intervention affects the time from "Admit Decision" to "Departure from EC." 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.

# Physician Attitudes Toward a Shared Decision-making Based Tool for Communication of Choice in Childbirth

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## INTRODUCTION

The ideal birth plan can improve communication between patient and provider and protect patient autonomy, yet many of the current birth plan templates fall short of the ideal in many ways. A birth plan can be used as a tool to improve the communication of choices between the caregiver and the patient, but in order to do this it must move beyond a simple checklist of desires. The reality of 21<sup>st</sup> century medicine is that often the path is not clear and more than one right choice exists. To provide the best patient care within this framework, it is more important than ever for communication between the physician and patient to remain open. Shared decision making has been called the pinnacle of patient centered care, yet no tool exists that seeks to reconcile what matters to the obstetric patient with the choices the physician deems to be medically necessary.

## METHODS

A recruitment letter will be placed on the Michigan State Medical Society's website, DocExchange. Inclusion criteria are physicians that are board certified in obstetrics and gynecology and practicing in the state of Michigan. All interviews will be recorded and conducted using the same interview template which consists of open ended questions regarding their experiences and opinions relating to birth plans. These interviews will be coded for emerging themes.

## ANTICIPATED RESULTS

It is hypothesized that physicians will have well developed opinions on the use of birth plans and that they would be interested in using a collaborative style template that is developed with both the patient and physician in mind.

## CONCLUSION

The results are expected to support the hypothesis that physicians would be interested in using a collaborative style template that is developed to optimize communication between the physician and patient.

# Prognostic Implications of Genomic Aberrations in Patients with Chronic Lymphocytic Leukemia at the Beaumont Hospital Cancer Center

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## INTRODUCTION

Chronic lymphocytic leukemia (CLL) is the most common adult leukemia in western countries. It is characterized by uncontrolled proliferation and accumulation of lymphocytic cells, which have acquired genomic aberrations. Specific genetic abnormalities have been shown to play a crucial role in clinical presentation and disease progression in patients with CLL. This study aims to assess the incidence of chromosomal abnormalities and the associated outcomes in patients with CLL treated at Beaumont Health. We hypothesize that 17p deletions lead to more unfavorable outcomes compared to sole 13q deletions.

## 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, the incidence of CLL, and types of cytogenetic abnormalities were documented. SPSS 21 was used for data analysis and a Kaplan-Meier curve was plotted for survival. Log rank (Mantel-Cox) was used to compare the curves. 12-month 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. 82.1% (124) of patients were white, 4.0% (6) African American, 1.3% (2) Asians and 12.6% (19) declined to identify their race. The cytogenetic distribution of those assessed showed that 7.3% (11) of patients had a sole 13q deletion, 3.3% (5) with 11q deletions, and 2.0% (3) with 17p deletions. Patients with a sole 13q deletion had a 90.9% survival rate at both 12 and 36 months. Conversely, Patients with a 17p deletion had a survival rate of 100% at 12 months and 0% at 36 months.

## CONCLUSION

The results support the hypothesis that CLL patients with a 17p deletion have the worst prognosis, while those with a sole 13q deletion have the best prognosis.

# HistoConnect: An Online Integrated Module

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## INTRODUCTION

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. 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.

## METHODS

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.

# Community Perception of Healthcare Providers Treating Sexual Assault

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## INTRODUCTION

An estimated 1 in 7 women will be victims of sexual assault during their lifetime. In a university setting, data suggests as many as 1 in 4 women will be victims of sexual assault. With high incidence rates, it is important that healthcare providers are able to address a variety of medically relevant treatment needs including: physical injuries, prophylaxis for potential sexually transmitted infections (STIs), emergency contraception, and psychosocial and emotional support. However, only 25% of women who experience sexual assault seek treatment from physicians or mental health professionals. This study will use focus groups to better understand (1) women's perception of healthcare providers who treat victims of sexual assault and (2) what women in the community want when seeking and receiving treatment for sexual assault. We hope that by identifying the strengths and weaknesses of healthcare providers' treatment of sexual assault, we can make the patient-doctor interaction more efficient and beneficial.

## METHODS

We will conduct 5-6 focus groups of 5-8 women to include a minimum of 30 participants. We hope to collect qualitative data that is representative of the concerns potential patients have when trying to seek treatment from healthcare providers. We will use transcribed focus groups to identify common themes across focus groups.

## ANTICIPATED RESULTS

We hope focus groups will identify what women want from their healthcare providers when they seek treatment for sexual assault. We expect that women seek compassionate, patient, and supportive healthcare. However, we expect that these ideals may not always reflect what patients experience or expect to experience when receiving treatment.

## CONCLUSION

We expect the results will help us understand what women want from their healthcare providers when seeking care for sexual assault. We hope that the information we collect will help healthcare professionals provide better care in the future.

# Therapeutic Hypothermia in Post-Cardiac Arrest Patients

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## INTRODUCTION

Therapeutic hypothermia (TH) has become a routine therapy in comatose patients after cardiac arrest resuscitation due to its ability to reduce neurological damage and improve outcomes. Despite the prolonged QT interval in TH, QT prolongation has not been linked to life-threatening arrhythmias. There are currently a limited number of large studies showing the effect of prolonged QT interval association with therapeutic hypothermia, and its correlation with cardiac dysrhythmias. Thus, this project aims to describe the frequency of ECG interval changes and clinically relevant dysrhythmias in TH patients.

## METHODS

This is a retrospective observational study from January 2009 to December 2015. Patients who qualified for the study, i.e. had a non-traumatic cardiac arrest with a return of spontaneous circulation (ROSC), received TH, 33.5°C for 24 hours. ECG interval changes and dysrhythmias were recorded immediately after ROSC, at 33.5°C, and after rewarming.

## RESULTS

A total of 322 patients (age  $61.0 \pm 16.9$  years) had TH initiated during the study period, 13 died prior to completing 24 hours of hypothermia and 110 lacked all the ECG data. The patients were predominately male (62.5%), 76% had an out-of-hospital arrest, 16.1% had a STEMI on initial ECG, and 35.7% survived to hospital discharge. There were statistically significant decreases in heart rate during TH ( $96.1 \pm 25.8$ /min before TH;  $69.5 \pm 19.1$ /min,  $p < 0.005$ ); QRS duration ( $115.7 \pm 32.0$  ms before TH;  $108.1 \pm 27.9$  ms during TH,  $p < 0.005$ ); and QTc ( $488.0 \pm 51.9$  ms before TH;  $527.8 \pm 61.0$  ms during TH,  $p < 0.005$ ). EKG changes resolved during rewarming without evidence of clinically significant dysrhythmias.

## CONCLUSION

TH was associated with statistically significant ECG interval changes i.e. QRS and QTc, which resolved and were not associated with cardiac dysrhythmias. We are currently analyzing EKGs to determine the frequency of clinically significant dysrhythmias before, during, and after TH.



# Publication Trends of Breast Cancer-related Lymphedema from 2007-2016: a Bibliometric Study

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## INTRODUCTION

Breast cancer-related lymphedema (BCRL) refers to tissue swelling—typically of the arm—that occurs due to inadequate lymphatic drainage following breast cancer therapy. We conducted a bibliometric analysis to identify publication trends in terms of: yearly BCRL research output, most productive authors contributing to BCRL research, most productive institutions contributing to BCRL research, most productive countries contributing to BCRL research, most productive journals publishing BCRL research, most common BCRL study types, and most common BCRL study purposes.

## METHODS

A search for indexed English abstracts was performed in PubMed. Only original BCRL research articles involving human subjects were included. Data collected for each article included: name(s) of the first and last author(s), journal of publication and impact factor (IF), publication year, country of author(s), income level of country, institution(s) of author(s), study type, and study purpose.

## RESULTS

We identified 1,144 publications. Five hundred seventy (570) articles met our criteria. The calendar years with the greatest ratios of publications are: 2016 (16.1%), 2015 (14.2%), 2013 (11.2%), and 2012 (11.2%). Authors who produced the largest number of BCRL-related publications are primarily located in the USA (32.8%), Australia (9.6%), and South Korea (6.7%). Eight of the leading ten BCRL research institutions, in terms of productivity, are in the USA while the remaining two are in Australia. The most common study designs are cohort (31.1%), cross sectional (25.4%), and clinical trials (18.5%). Finally, these studies most frequently investigated the diagnosis / education (35.5%), treatment (30.2%), and risk / risk factors (25.3%) of BCRL.

## CONCLUSION

BCRL research productivity is on the rise—particularly in developed countries—as healthcare providers increasingly focus on the quality of life-impairing aspects of breast cancer. This bibliometric analysis of existing publications characterizes, contributes to, and encourages the emerging literature investigating the diagnosis, prevention, and management of breast cancer-related lymphedema.

# Trends in Biopsy Diagnosed Cervical Dysplasia: A Retrospective View

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## INTRODUCTION

The U.S. Preventive Services Task Force (USPSTF) recommends that women younger than 21 or older than 65, who have an adequate history of negative testing, need not undergo pap smears, which screen for cervical cancer. The primary aim of this study is to determine what the annual incidence of cervical dysplasia in is, irrespective of age. Secondly, this study aims to examine the frequency of cervical dysplasia in women over the age of 50 to further investigate USPSTF recommendations.

## METHODS

A retrospective chart review of biopsy diagnosed cervical dysplasias from 2000-2010, in the pathology electronic records of the Beaumont Health System at Royal Oak, was used. Objective I will be met by gathering 10,000 data points, which will then be separated based on age and analyzed to determine the incidence of cervical dysplasia based on age group. Objective II will be met by analyzing the data to elucidate trends of biopsy diagnosed cervical dysplasia in women older than 50 years.

## RESULTS

It is anticipated that the data will depict a significant number of cases of biopsy diagnosed cervical cancer in women older than 50 years of age. Additionally, it is anticipated that an increased incidence of cervical dysplasia in women older than 50 years would also be depicted.

## CONCLUSION

An increasing trend of cervical dysplasias in older women would highlight the need to modify national guidelines to screen women of all ages for cervical cancer with pap smears. Non-significant results would indicate that there has not been a statistically significant increase in cervical dysplasias in older women over the specified time period, thus supporting current national guidelines.

# Correlation Between Features in a Complete Blood Count, Peripheral Smear and Bone Marrow Biopsy Result

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## INTRODUCTION

Complete blood count (CBC), peripheral smear and bone marrow biopsies (BMB) are routine laboratory tests that are utilized widely for hematologic pathologies. However, correlation between these tests is not well established. The primary objective of this study is to identify factors both in CBC and peripheral smear that will correlate with an abnormal BMB outcome. A secondary objective of this study is to evaluate if peripheral smear aided in diagnosing patients who also had a BMB. Lastly, a tertiary objective of this study is to compare patients who had a blood transfusion with or without a peripheral smear and determine time to diagnosis.

## METHODS

This study is a retrospective chart review of patients (n = 671) between June to December 2015 at Beaumont Hospital. Data of patients who had a CBC, peripheral smear and a BMB will be analyzed to determine what specific factors in CBC and smear, if any, correlate with abnormal BMB result. Further, review of patients who had a smear and a BMB will be examined to determine if the smear added any diagnostic value to the final diagnosis. Lastly, chart review of patients who received a peripheral smear prior to blood transfusion for a non-acute condition will be compared to those who got a transfusion and a smear afterwards to identify if there was any delay in diagnosis.

## ANTICIPATED RESULTS

With respect to peripheral smears, it is anticipated that it may not add much diagnostic value in prompting the need of a BMB. In addition, patients who received blood transfusion prior to a peripheral smear may have experienced a delayed diagnosis compared to those who had a peripheral smear done first.

## CONCLUSION

Identifying patterns and important diagnostic predictors among CBC, peripheral smear and BMB may lead to earlier diagnosis and treatment.

# Empathy and Spirituality: Understanding the Relationship to Burnout in Primary Care Physicians

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## INTRODUCTION

Burnout is prevalent among 54.4% of physicians according to a 2014 nation-wide study, an increase of 8.9% from 2011. This burnout negatively affects the physician's health, increases errors, and increases the physician's desire to abandon medicine. The primary goal of this study is to investigate if spirituality and empathy act to protect primary care physicians from burnout symptomology.

## METHODS

Michigan family medicine, internal medicine, and pediatric physicians will receive an electronic survey sent through the Michigan State Medical Society email distribution list. The survey will quantify levels of empathy, spirituality, and burnout. The survey will include widely used and validated instruments, such as the Maslach Burnout Inventory (MBI), Toronto Empathy Questionnaire (TEQ), and Spirituality Involvements and Belief Scale (SIBS)— and also collect physician demographics. Correlations and ANOVA analysis will be run to identify significant associations between all variables.

## ANTICIPATED RESULTS

The anticipated results of this study will demonstrate that spirituality and empathy act to protect physicians from burnout, and in combination demonstrate augmented protection. If this hypothesis is correct, the project will identify important variables that may promote positive emotional and mental health among practicing physicians in the U.S. Also, this study anticipates that primary care providers who have practiced for 11-20 years will demonstrate the strongest negative association between burnout and a combined spirituality and empathy. Physicians in this range are shown to have the highest level of burnout and depersonalization.

## CONCLUSION

The results of this research study are expected to demonstrate that empathy and spirituality act to protect physicians from burnout. If the hypothesis is correct, this study will encourage further research into the development of interventions to protect primary care providers from burnout.

# Evaluating the Effectiveness of Cooking Matters Nutrition Education Classes

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## INTRODUCTION

Nutrition programs are becoming increasingly common and previous data indicates they effectively engage participants and promote change in behavior. Cooking Matters is one such program held at various locations across the United States. At the class, which consists of 6 two-hour sessions over 6 weeks, participants learn various ways to improve their health, such as how to cook appetizing, healthy foods and read nutrition labels. To gauge its effectiveness, this study will measure blood pressure change in hypertensive participants before, during, and following the course. The goal of this study is to determine if participants with hypertension achieve lower blood pressure following completion of the program.

## METHODS

A minimum of 10 participants will be sought for this study. Blood pressure will be measured at the first course, final course, and 4 months after the first course. Blood pressure will be measured using an automatic sphygmomanometer. The first-course average blood pressure measurement will be compared to the 4-month average blood pressure measurement using a paired t-test.

## ANTICIPATED RESULTS

Initial blood pressure measurements will be treated as the control, since it is reasonable to assume that without intervention, blood pressure in hypertensive adults would either stay the same or increase. In addition, previous similar studies have used initial values as control. Compared to the control group, the treatment group is expected to have a lower average blood pressure.

## CONCLUSION

The results are expected to support the hypothesis that the Cooking Matters program is effective at reducing health risks and improving health outcomes associated with a reduction in blood pressure levels in adults diagnosed with hypertension.

# Creation of an Online Multidisciplinary Self-learning Tool for Medical Students

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## INTRODUCTION

An integrated, multidisciplinary and problem-based curriculum that incorporates self-study and self-preparatory materials in a single place is necessary in medical schools. The creation of such educational tools will allow to optimize in-class time for engaging higher order levels of cognitive skills, help students self-assess their progress and facilitate the integration of basic science and clinical knowledge. The aim of this study is to develop a comprehensive and interactive multidisciplinary immunopathology self-study tool combined with problem-based lectures in a flipped classroom format, to determine how this approach compares to lecture-only teaching in terms of student preference, material organization and presentation, easiness of learning, and application of basic science into solving clinical vignettes, as well as to evaluate its efficacy as part of the medical school curriculum at Oakland University William Beaumont School of Medicine (OUWB).

## METHODS

The module begins with a baseline assessment to determine student knowledge in immunology and pathology. The module will consist of explanatory videos, animations, multiple choice questions, and explanatory written passages. Lectures will be substituted by case-based discussion of clinical vignettes in immunopathology. The flipped-classroom will be part of the Basic Foundations of Clinical Practice-2 course for M1 medical students at OUWB. Upon completion, students will have access to an anonymous survey to evaluate the module and problem-solving session.

## ANTICIPATED RESULTS

It is expected that the flipped classroom will promote a multidisciplinary environment that allows for in-depth integration of basic science immunology and pathology into solving clinical vignettes as part of an integrated curriculum at OUWB, in a format that promotes self-paced, problem-based learning and self-assessment opportunities.

## CONCLUSION

An interactive, multidisciplinary, and problem-based flipped-classroom experience will promote self-directed learning in immunopathology and allow for evaluation of its efficacy as part of the curriculum at OUWB. This approach could serve as platform for the development of new integrative educational materials.

# A Comparison of Laparoscopic and Robot-assisted Ventral Hernia Repair

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## INTRODUCTION

The term “Ventral Hernia” covers a large subset of conditions including epigastric, umbilical, Spigelian, hypogastric, and incisional hernias. While most studies suggest that robotic ventral hernia repair (VHR) may lead to shorter length-of-stay (LOS) and fewer complications compared to laparoscopic VHR, no studies have directly examined whether this is true. The primary aim of this study is to compare the recovery and complication rates of laparoscopic versus robotic VHR.

## METHODS

Retrospective data was analyzed from 100 laparoscopic VHR surgeries, as well as 100 robotic VHR surgeries performed at Beaumont Health System between March 2014 and April 2016. Charts were reviewed for LOS and post-op complications. LOS comparisons were performed using an Inverse Probability Weighted (IPW) Negative Binomial Regression, likelihood of same-day surgery was calculated via IPW Logistic Regression, and complication rates were compared using the Firth Logistic Regression.

## RESULTS

After controlling for Race, BMI, previous abdominal surgeries, previous hernia repairs, operating location, hernia type, and surgeon, patients undergoing Robotic Surgery had a 38% reduction (IRR: 0.62) in LOS compared to those undergoing Laparoscopic Surgery (p value = 0.006). After weighting for differences between groups, average LOS for robotic and laparoscopic groups was 1.3 and 2.1 days, respectively. Additionally, those undergoing Robotic Surgery were almost twice as likely (OR: 2.86) to have Same-Day Surgery (LOS = 0) as compared to those undergoing Laparoscopic Surgery (p value = 0.031). Although complication rates did not vary significantly between the two groups (all p values > 0.05), the robotic group experienced less complications in general than the laparoscopic group (14% vs 22%).

## CONCLUSION

Our data suggests that robotic VHR techniques can significantly reduce the amount of post-op time patients spend in the hospital and increase the likelihood of same-day surgery without negatively affecting complication rates.

# Investigating the Feasibility and Effectiveness of a Mindfulness-based Stress Reduction Course for Patients and Physicians: a Pilot Study

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## INTRODUCTION

While the East has practiced mindfulness-meditation for many centuries it has become increasingly popular as a mechanism for reducing stress in the Western world's fast-paced environment over the past few decades. Current research has shown that mindfulness-meditation can reduce stress and anxiety in those suffering from chronic medical conditions. Similarly, mindfulness-meditation can also reduce burnout in physicians; however, the literature lacks investigation of mindfulness incorporating both populations into one course taught by a certified instructor. This project will investigate the effectiveness and feasibility of an integrated course for both physicians and patients.

## METHODS

Approximately forty patients-and-caregivers (p/c) and sixteen physicians will participate in an eight-week course on mindfulness-based stress reduction (MBSR). The course consists of a 1.5-2.5 hour introductory session, 2.5 hour weekly sessions, and a 7.5 hour weekend retreat. The course integrates insight-meditation and mindful-yoga. Pre and post intervention perceived stress scales (PSS) will be obtained for the patients; PSS and Maslach-Burnout-Inventory scores (MBI) will be obtained for the physicians. These scores along with attendance will provide insights to the effectiveness and feasibility of a combined MBSR course.

## ANTICIPATED RESULTS

Patients are expected to have decreased stress levels; physicians are expected to have decreased stress levels and burnout scores. Both groups are expected to have high attendance. While there is no research on this unique MBSR course, data will be compared to existing literature and previous MBSR courses at Beaumont.

## CONCLUSION

Mindfulness meditation is an effective way to reduce stress in both patient and physician populations. This study will combine the two populations into a single MBSR course. Prominent reduction in stress for patients and physicians will provide new evidence for the combined course's effectiveness. This MBSR course could be a unique approach to target physician burnout as well as providing wellness for patients all in one.



# Prognostic Factors and Survival Outcomes in Patients with Chordoma in the United States: A Population-based Analysis

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## INTRODUCTION

Chordomas are rare bone tumors that account for 1-4% of all primary bone neoplasms. Although chordomas are generally considered benign, they exhibit locally aggressive behavior and indolent course of the tumor growth. While there are numerous single and multi-institution reports on prognostic factors and survival of chordoma, population data are scarce. Consequently, a more uniform study with larger population data is warranted. We used data from the population-based US Surveillance, Epidemiology and End Results (SEER) cancer registry to determine factors affecting both overall survival (OS) and disease-specific survival (DSS) after diagnosis.

## METHODS

1598 patients in the SEER database, diagnosed with chordoma from 1973-2013 were reviewed. Kaplan-Meier univariate analysis and Cox Regression multivariate analysis were performed to examine prognostic factors in overall survival (OS) and disease-specific survival (DSS).

## RESULTS

Kaplan-Meier analysis showed an OS and DSS were 61% and 71% at 5 years, 41% and 57% at 10 years. Multivariate Cox regression analysis demonstrated that independent predictors of OS and DSS to be age at diagnosis (HR = 2.80 [95% CI, 2.12-3.70],  $P < .001$ ; HR = 1.60 [95%CI, 1.18-2.16],  $P = .002$ ), surgical treatment (HR = 0.62 [95% CI, 0.52-0.73],  $P < .001$ ; HR = 0.64 [95%CI, 0.52-0.79],  $P < .001$ ), radiation therapy (HR = 1.23 [95% CI, 1.07-1.42],  $P = .004$ ; HR = 1.29 [95%CI, 1.09-1.54],  $P = .004$ ), tumor size (HR = 1.53 [95% CI, 1.32-1.78],  $P < .001$ ; HR = 1.62 [95%CI, 1.35-1.94],  $P < .001$ ) and distant metastasis (HR = 3.40 [95% CI, 2.45-4.71],  $P < .001$ ; HR = 3.77 [95%CI, 2.61-5.45],  $P < .001$ ).

## CONCLUSION

We report the largest study to evaluate prognostic factors of patients with chordoma. We demonstrate that older age, radiation therapy, greater tumor size and distant metastasis were correlated with decreased survival, whereas surgical resection was correlated with increased survival.

# Interventions to Improve Meal Offerings and Nutrition Offered to Homeless Shelter Clients

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## INTRODUCTION

Faith-based organizations supporting a rotating shelter face many difficulties when providing healthy meals to the homeless. Some of these difficulties spawn from the minimal communication that currently exists between preceding and succeeding congregations and from shelter clients. Additional meal planning setbacks derive from the lack of nutritional guidance on how to support and accommodate particular health needs via nutrition. Based on previous survey data collected from shelter clients and hosting congregations, an interactive nutrition resource was created to improve the nutritional value of meals provided, improve communication between congregations and shelter clients, and make the meal planning process more seamless for hosting congregations. The overarching goal of this study is to increase the nutritional value of lunches offered to shelter clients in order to promote health and further develop healthy eating habits.

## METHODS

Two interventions will be utilized during this study that aim to improve the nutritional value and variety of lunches offered to shelter clients by hosting congregations. The first intervention is an interactive nutrition resource that will be offered to host congregations. The second intervention involves offering insulated lunch bags, food storage containers, and freezer packs to shelter clients. The nutritional value and variety of lunches provided to shelter clients will be assessed for two weeks before and two weeks after the interventions are offered. The food provided will be assessed using the NCC Food and Nutrient Database and will be compared to the recommended USDA dietary guidelines.

## ANTICIPATED RESULTS

Improvements in the nutritional value and variety of lunches provided to shelter clients by host congregations are expected after the interventions are established.

## CONCLUSION

The developed interventions aim to provide a solution to a common set of problems rotating shelters face in providing healthy meals to homeless clients.

# Gender Differences in Emotional Memory of Clinically Diagnosed Post-traumatic Stress Disorder Individuals Experiencing Sleep Disturbances

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## INTRODUCTION

According to the National Institute of Mental Health, 3.5% of U.S. adult population has post-traumatic stress disorder (PTSD) and 36.6% of those cases are classified as “severe”. Prior research has shown sleep disturbances, a hallmark symptom of PTSD; affect emotional judgment with gender differences in emotional memory processing. The goal of this study is to assess gender differences individuals suffering with PTSD, so treatment can further be tailored to target individual needs based on these factors.

## METHODS

150 undergraduate students from Oakland University will undergo trauma exposure screener and a PTSD symptom measure, and a Diagnostic and Statistical Manual of Mental Disorders screener to determine eligibility for participation and categorization into trauma exposed with PTSD, trauma exposed without PTSD, and no trauma without PTSD. Participants will then be randomized into one of two experimental conditions of nap or relaxing. Participants. All participants will complete an emotional reactivity task in which they will view images of emotionally valences pictures and determine how aroused the images make them feel prior to and post experiment to determine gender differences. The nap condition participants will be escorted to a sleep room while the relaxing condition participants will be assigned to 90 minutes of relaxation or quiet activity. Basic statistical techniques, such as ANOVA, ANCOVA, or Regression will be used analyze the collected results.

## ANTICIPATED RESULTS

Gender differences are expected in all categories of participants. Female participants and trauma exposed with PTSD are expected to have a stronger response to masked fearful and angry faces and unmasked happy faces.

## CONCLUSION

The results are expected to provide a better understanding of gender differences in emotional memory. This will allow for future development of treatment for individuals (men and women) affected by sleep disturbances associated with PTSD.

# Unique Clinical and Pathological Characteristics of Young African American Women Diagnosed with Breast Cancer at Beaumont Health

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## INTRODUCTION

Breast cancer is the most common cancer in women in the U.S. and it affects approximately 1 in every 8 women. From 2008 to 2012, breast cancer incidence rates increased 0.4% per year in black women. African American women often present to clinic with specific breast cancer subtypes at aggressive stages. The primary goal of this study is to determine the unique clinical and pathological characteristics of young African American women diagnosed with breast cancer at Beaumont Health and determine what makes them distinct from Caucasian American women.

## METHODS

A retrospective chart review will analyze African American women under the age of 46 diagnosed with breast cancer at Beaumont Health from 2005-2015. Data will be collected from the Beaumont Tumor Registry. The analysis will compare several variables of interest including epidemiology, histopathology, tumor, lymph node and metastases (TNM) staging, surgical management, family history of cancer diagnoses, and genetic testing to those of Caucasian American women under the age of 46 diagnosed with breast cancer at Beaumont Health. A multivariate test will be used to analyze the variables of interest.

## ANTICIPATED RESULTS

Compared to the control group of Caucasian American women, African American women are expected to exhibit unique clinical and pathologic features of their breast cancer and also may demonstrate different genetic etiologies. It is further expected that this information will help guide future treatment and management for these patients.

## CONCLUSION

The results are expected to indicate that young African American women present with breast cancer that has unique clinical and pathologic characteristics that will allow us to better understand the biology of this disease in African Americans. This would be significant to the future diagnosis, treatment and outcomes of breast cancer in African American women.

# Optimizing the Diagnosis of Obstructive Sleep Apnea

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## 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 either two separate nights (one for the basal PSG, another for the CPAP titration study) or a split night (initial PSG, with CPAP the remainder of the night), which is cheaper. No clear guidelines exist in determining whether patients should undergo two separate nights or a split night study. Establishing a screening tool that increases usage of split night assays will allow patients to save time while maximizing study results.

## METHODS

In a previous study, one of the authors identified the following OSAS risk factors through multivariable regression analysis of a patient database referred for a basal PSG: snoring frequency, apnea, age, gasping, and waking sleep partner. Using a separate patient database (n=422), this project aimed to develop a screening tool for split night study, and an iterative algorithm which tests different weights for each risk factor. Optimal weights were determined by comparing the ROC curves of each model. The algorithm was written in the R language, and will be made publicly available to researchers.

## 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 sleep 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 a split night study.

# An Educational Intervention: Increasing Physician Awareness of the WHO List of Essential Medicines

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## INTRODUCTION

The World Health Organization (WHO) Model List of Essential Medicines provides a well-validated set of drugs that addresses the need for pharmaceutical availability in light of global medicine shortages. The primary goal of this study is to create an educational intervention to increase physician knowledge of the WHO Model List of Essential Medicines, its importance in the continuum of care and medication safety standards in global practice. The secondary goals are to identify barriers to following these recommendations among Beaumont physicians and the extent of their charitable contributions when practicing globally.

## METHODS

In a prior study, physicians at Beaumont Health System were surveyed to identify clinicians who are globally engaged. An educational module will be developed to inform these physicians of the WHO Model List of Essential Medicines and its relevance to their global practice. Data will be collected through a post-session Qualtrics survey to assess the effectiveness of the intervention. The survey will identify compliance barriers among the physician cohort and measure previously unquantified data on the magnitude of charitable contributions by Beaumont physicians.

## ANTICIPATED RESULTS

The educational module is expected to increase awareness of the WHO Model List of Essential Medicines among globally engaged Beaumont physicians. The study will identify barriers that physicians encounter in implementing these recommendations by the WHO when volunteering internationally. This study will also quantify the amount of time, medication, and durable medical equipment provided to overseas programs by Beaumont physicians and the monetary value of these donations.

## CONCLUSION

The results are expected to demonstrate the significance an educational intervention discussing the WHO Model List of Essential Medicines can have in optimizing the continuity of patient care in lower-middle income countries. We anticipate that when provided with this information, globally engaged Beaumont physicians will increase their utilization and donation of essential medicines.

# Health Vulnerabilities in Homeless Patients: A Grounded Qualitative Study

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## **INTRODUCTION**

The Vulnerability Index-Service Prioritization Assessment Tool (VI-SPDAT) is a qualitative survey used by homeless shelters, hospitals, and other organizations to measure the vulnerability of homeless individuals and provide them with the appropriate amount of services based on need and risk of mortality. An individual's score on the VI-SPDAT is especially significant in determining temporary or permanent housing options. The VI-SPDAT has been edited and re-released since its conception; the primary goal of this study is to create research-based recommendations to be considered for the next revision.

## **METHODS**

This will be a qualitative study that uses a semi-structured interview design and analytic techniques rooted in grounded theory. The participants in this study will be homeless individuals who utilize HOPE Recuperative Center and HOPE Hospitality and Warming Center. The objective is to uncover themes through analyzing existing VI-SPDAT questions and producing recommendations to improve the Index. Data from this research will be collected using semi-structured interviews that are audio-recorded. Because this will employ a methodology based on grounded theory techniques, data will be collected and analyzed cyclically until no new themes emerge (saturation).

## **ANTICIPATED RESULTS**

Analysis of the data is expected to reveal discrepancies between the quantitative responses previously recorded in the VI-SPDAT and qualitative responses that will be completed during interviews. These discrepancies will highlight questions that are fit for revision.

## **CONCLUSION**

This project seeks to contribute to current research on homeless prioritization and assistance tools with the goal of improving the format and content of the VI-SPDAT, a housing prioritization and assistance survey. This could improve the accuracy of patient data and thus the efficiency of services offered to each patient in terms of temporary and permanent housing. As housing status is a significant factor in an individual's general health status, the project seeks to improve health outcomes of the individuals it serves.

# 7- and 30-day Outcomes for Emergency Department Inpatients Presenting with Chief Complaint of Dizziness

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## INTRODUCTION

Dizziness is a common complaint by patients presenting to the Emergency Department (ED). In fact, dizziness accounts for a staggering 7.5 million visits to the ED annually. The clinical outcomes of dizziness patients are numerous and complex, the majority of which are vaguely identified in literature with no clear correlation to their underlying causative factor. Therefore, the goals of this study are to: determine the outcomes of patients with the chief complaint (CC) of dizziness at 7 and 30-day post-ED discharge; the interrelationship between each outcome with the patients' history, physical exams, and work-procedures conducted at the time of ED admission; the cost-benefit analysis of diagnostic tests for patients with CC of dizziness.

## METHODS

The study will analyze patients admitted to the ED with a complaint of dizziness. The patients will be contacted 7- and 30-days after discharge from the hospital with a scripted phone survey. After obtaining consent during the initial phone call, the patients will be subsequently enrolled into the research. Subsequently, the medical data during their ED admission will be retrospectively analyzed and extracted into a data extraction sheet. It will consist of information such as patient demographics, ED diagnosis, etc. The purpose of utilizing the data extraction sheet is to identify risk factors associated with the etiologies of dizziness.

## CONCLUSION

In this project, determining the 7- and 30-day outcomes of patients with dizziness will facilitate the identification of a multitude of clinical outcomes that ED physicians can expect to encounter in relation to the causative factor of dizziness. This study can provide data regarding the manifestation of future complications that may arise in patients with dizziness such as stroke, heart disease, or sepsis.



# Genetic Comparisons of *Plesiomonas Shigelloides*' Exotoxins to Similar, Public Health Relevant, Gram-negative Bacilli

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## INTRODUCTION

*Plesiomonas shigelloides* is a Gram-negative gastrointestinal bacterium, most commonly manifesting in human hosts through the ingestion of contaminated water or shellfish. The pathogenicity of *P. shigelloides* is widely debated with multiple studies taking a strong stance on either side of its pathogenic status. By analyzing the DNA of *P. shigelloides*, comparisons it to other similar bacteria with known exotoxins to determine which toxins *P. shigelloides* can produce. These subsequent results would add validity to one side of the pathogenicity debate.

## METHODS

The genetic sequence of the *P. shigelloides* type strain (14029) was obtained from the American Type Culture Collection (ATCC) and was sequenced from an outside DNA sequencing lab. The DNA was then pieced back together to reform the complete genome. Utilizing the BLAST sequencing software available on National Center for Biotechnology Information (NCBI), the toxin DNA of other Gram-negative bacteria will be compared to *P. shigelloides* to determine the fidelity of binding. If strong binding occurs, this will indicate which toxins *P. shigelloides* is able to produce and can therefore allow assertions about its potential pathogenicity.

## ANTICIPATED RESULTS

Due to the suspected pathogenicity of *P. shigelloides* described in some of the literature, at least one or two common Gram-negative toxins may be identified. This would add support to the idea that *P. shigelloides* does have pathogenic potential and therefore should be indicated for further research.

## CONCLUSION

The results are expected to support the hypothesis that *P. shigelloides* is, in fact, a pathogenic bacteria. This would be strongly supported by the high fidelity DNA binding of other bacterial toxins to that of *P. shigelloides*. This would enlighten the public health community of potential damage from an outbreak and subsequent treatment regimens. This would also prove very useful in curbing and eliminating the bacteria more quickly than would otherwise be possible.

# Using Cultures of Organ Preservation Fluid to Guide Antimicrobial Prophylaxis in Liver and Kidney Transplant

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## INTRODUCTION

In the United States, 66 patients undergo transplant surgeries every day from either a living or deceased donor. Most of these patients have waited extensively for an organ. When organs are harvested, they are transported between patients in organ preservation fluid (OPF) to preserve their function. Once the organ is placed in the fluid, the fluid becomes exposed to any pathogen in or on the organ. Because of this, OPF can be cultured to identify potential pathogens that would put the organ recipient at risk. This is where the idea of prophylaxis can help to improve the outcome of transplant recipients. This study aims to establish fluid culturing as a standard of care at Beaumont Hospital.

## METHODS

75 samples of OPF from kidney or liver transplants at Beaumont Hospital in Royal Oak, Michigan will be obtained at the time of back table organ preparation. Samples will then be sent to the Microbiology Laboratory to be cultured for anaerobic, aerobic, and fungal species. Results from the samples will be used to determine prophylactic regimens that will subsequently be given to the transplant recipient. Patients will then be followed for one year to evaluate outcomes.

## ANTICIPATED RESULTS

OPF cultures will show pathogens that could possibly infect the host before symptoms arise, that would otherwise not have been recognized. It's anticipated that by treating these infections prophylactically before any symptoms arise there will be a decrease in the number of infections at each time point of the study.

## CONCLUSION

With this study's success, there could be implementation of OPF cultures and prophylaxis for every organ transplant to improve patient outcomes. This study could encourage future research to study relationships between the outcomes of the OPF cultures and cultures from deceased donors, as well as molecular testing on organ preservation fluid to rapidly identify potential pathogens.

# The Effect of Health Insurance Among Homeless Individuals' Visits to the Emergency Department

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## INTRODUCTION

The volume of uninsured patients treated by U.S. Emergency Departments (ED) puts substantial strain on the healthcare system, as uncompensated medical care costs hospitals \$40 billion annually. This study examines the relationship between homelessness, insurance status, and patterns of ED use.

## METHODS

Data from over 506 million patient visits recorded in the National Hospital Ambulatory Medical Care Survey (NHAMCS) from 2007 – 2011 was analyzed using SPSS 24.0.0.0. Four subsets of homeless populations were studied: insured-recidivistic, uninsured-recidivistic, insured-nonrecidivistic, and uninsured-nonrecidivistic. Recidivism was defined as four or more ED visits in the last twelve months. Other variables included common diagnoses, wait times, length of visits (LOV), triage acuity levels, and prevalence of tri-morbidities (coexisting diagnoses of substance abuse, mental illness, and a chronic condition).

## RESULTS

Homeless patients average 14 minutes of additional wait time despite similar triage acuity (2.90 and 2.96 respectively). Interestingly, insured-nonrecidivistic homeless patients have the longest wait time (71 minutes), despite having the highest acuity (2.34). Insured-recidivistic patients are seen most quickly by a physician (53 minutes).

The LOV is significantly longer for homeless patients (5.52 hours), compared to housed patients (3.33 hours). Homeless, uninsured-recidivistic patients spend 8.18 hours in the ED, by far the highest. Housed uninsured-recidivistic have the shortest LOV (2.98 hours).

Four of the top ten diagnoses for homeless ED patients involve substance abuse or mental illness. On disposition, homeless patients are 9.8 times as likely to be admitted to a psychiatric hospital compared to housed patients (4.9% versus 0.5%). Consequently, homeless patients are also 7.5 times more likely to exhibit tri-morbidity (5.3% versus 0.7%).

## CONCLUSION

Longer wait times for homeless patients show a bias for treating housed patients first, while extended LOV for homeless patients exemplify the difficulties of proper dispositions. Importantly, the higher percentage of homeless patients experiencing tri-morbidity demonstrates their increased susceptibility to serious medical conditions.

# Prevalence of Pulmonary Hypertension in Patients with Chronic Kidney Disease Undergoing Different Types of Renal Replacement Therapy and Those Who Have Undergone Transplant

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## INTRODUCTION

A significant epidemiological overlap is observed between patients with CKD and WHO Group 1-4 Pulmonary Hypertension. WHO Group 5 has emerged as a new class of PH, which classifies the PH as having multifactorial causes, and lists CKD/ESRD as one of them. PH in these patients is an independent predictor of increased mortality in those undergoing dialysis or kidney transplantation. There are studies that establish a relationship between PH and CKD, AV-Fistula, Hemodialysis and Peritoneal dialysis, but no association with an individual risk factor has been established, and no specific mechanism has been confirmed for either of those factors.

## METHODS

A retrospective chart review will be carried out at the Royal Oak, Troy and Grossepoint locations of Beaumont Health System. Patients with a past medical history of CKD or those discharged with a diagnosis of CKD between the months of July 2010 and July 2015 will be included in the chart review. A sample size of 700 individuals is anticipated and the large sample size will provide a large amount of data that can be interpreted to provide a clinically significant result.

## ANTICIPATED RESULTS

Relating to previous studies that have showed association between pulmonary hypertension and CKD patients undergoing renal replacement therapy, we expect to find a higher prevalence in those undergoing hemodialysis versus those undergoing peritoneal dialysis. The results of those who have undergone transplants will be compared at the end of the study.

## CONCLUSION

The results of the study will allow for a better representation of the prevalence of pulmonary hypertension in patients with CKD, and will guide future researchers closer to understanding the pathogenesis of CKD associated pulmonary hypertension.

# Paramedics' Perceptions of Homeless Patients

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## INTRODUCTION

While patient trust is an important indicator of patient adherence to treatment recommendations and improving health outcomes, homeless patients face discrimination in health care environments and exhibit greater mistrust of health care providers. Paramedics often represent the first point of contact with health care for homeless patients because of the high frequency of emergency department encounters among the homeless population. Promoting positive interactions between paramedics and homeless patients is therefore important for promoting the latter's trust and comfort with health care. This study investigates the attitudes and perceptions of paramedics toward homeless individuals

## METHODS

This will be a qualitative study of paramedics, who have experience in ambulatory care, employed at three different Emergency Medical Services locations in the Metro Detroit area. Participants will be recruited via an email from coordinators at their respective EMS companies. Data will be collected via semi-structured interviews with individual respondents and will be analyzed using coding and categorization techniques akin to grounded theory.

## ANTICIPATED RESULTS

It is expected that paramedics have high exposure to homeless patients and have developed personal biases and attitudes about homeless patients based on those experiences, their frustrations with common attributes of homeless individuals, and limitations of the social service system, in concert with their own personal values and perspectives.

## CONCLUSION

The results will help identify potential biases commonly held by paramedics toward homeless patients that may hinder their relationships with those patients and interfere with communication. This will inform educational efforts for paramedics about homelessness and the needs and challenges of homeless patients.

# Does Bedside Ultrasound Improve Patient Satisfaction for Patients Receiving an Abdominal Computed Tomography in the Emergency Department?

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## INTRODUCTION

This project aims to investigate whether or not receiving a bedside ultrasound (US) will increase patient satisfaction for those receiving an abdominal/pelvic computed tomography (CT) scan. Satisfaction becomes increasingly important in the Emergency Department (ED) as it provides patients' first and perhaps only impression of a healthcare institution. Previous studies have shown that bedside ultrasound has increased patient satisfaction and improved perception of their Emergency Medicine (EM) physician and this study aims to expand on this research and standardize patients based on use of abdominal/pelvic CT. The project secondarily aims to utilize the survey responses from patients as a clinical competency measurement for rotating EM residents.

## METHODS

A convenience sample of patients who receive a diagnostic abdominal/pelvic CT scan and no formal or informal bedside US (EUS) will be used. This group will serve as our control group. A second group of patients who both received a diagnostic abdominal/pelvic CT and formal or informal US will serve as our experimental group. An information sheet will be provided and patients, once consented, will complete an anonymous questionnaire about their overall ED satisfaction, satisfaction with diagnostic testing, and interaction with their physician. Two-tailed  $p$  tests will be used to compare satisfaction between the two groups with a  $p < 0.05$  being considered significant.

## ANTICIPATED RESULTS

Upon completion of this study, it is anticipated that the experimental group receiving a bedside ultrasound will report increased levels of patient satisfaction, as a result of increased contact with their physician and feeling more involved in their care.

## CONCLUSION

This study could help find a cost-effective solution to a long-standing issue of long waiting times, low satisfaction, limited physician contact associated in Emergency Department visits and improve the patient's perception of the patient-physician relationship in the ED.

# Time Dependent Patterns of Emergency Department Use by Homeless Persons

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## **INTRODUCTION**

There has been significant research on disproportionately high use of the emergency department 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, are there 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.

# Effects of Physical Activity in Mediating Medical Student Burnout in Preclinical and Clinical Years

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## INTRODUCTION

Burnout in medical students is a well-studied issue that negatively effects their physiologic and psychologic state. Burnout has been linked with suboptimal care practices in the clinic and is measured to be higher in students during their clinical years due to lower rates of confidence. Exercise is known to mitigate burnout, but little is known about the effects of physical activity on mediating the relationship between social interactions outside the academic setting and burnout in medical students. The purpose of this study is to determine the role physical activity has in mediating the relationship between social interaction, study time, and burnout levels in preclinical versus clinical students.

## METHODS

The data sample will include M1-M4 students at Oakland University William Beaumont School of Medicine. Burnout and physical activity will be measured using The Oldenburg Survey for Burnout and the Goldin Leisure-Time Exercise Questionnaire, respectively. Student also self-report time spent in social interactions outside of the academic setting. Analysis of data will determine if physical activity affects the relationship between amount of social interaction in clinical years and preclinical years with burnout.

## ANTICIPATED RESULTS

It is anticipated that increased physical activity will improve burnout levels in medical students with limited social interactions outside the hospital setting. It is also expected that there is a correlation between burnout and time spent on social interaction.

## CONCLUSION

Burnout affects approximately half of the US medical student population and is correlated with poor patient outcomes and increased medical errors. If evidence demonstrates that physical activity is able to positively mediate the relationship between burnout and social interaction, then this could emphasize the importance of wellness programs focused at medical students in their clinical years.



# Early Versus Late Gamma Knife Radiosurgery Following Transsphenoidal Surgery for Nonfunctioning Pituitary Macroadenomas

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## INTRODUCTION

Gamma Knife radiosurgery (GKRS) is frequently used to treat residual or recurrent nonfunctioning pituitary macroadenomas. There is no consensus as to whether GKRS should be used early after surgery or be withheld until there is evidence of imaging-defined tumor progression. Given a high incidence of adenoma progression after subtotal resection, this study will investigate the effect of radiosurgery timing on outcome.

## METHODS

This is a retrospective review of patients with nonfunctioning pituitary macroadenomas who underwent transsphenoidal surgery followed by GKRS from 1993 to 2013 at Beaumont Hospital – Royal Oak. Patients were matched by adenoma and radiosurgical parameters and stratified based on interval between last resection and radiosurgery. Operative results, imaging and clinical outcomes were compared across groups following early ( $\leq 6$  months after resection) or late ( $> 6$  months after resection) radiosurgery.

## RESULTS

After matching, 27 patients met study criteria and were grouped based on early (n=11) or late (n=16) GKRS following transsphenoidal surgery. Median imaging follow-up was 25.5 months (early group) compared to 98.2 months (late group) with  $p < .001$ . Median time to intervention was 3.3 months (early group) vs 31.1 months (late group) with  $p = < .001$ . No significant difference in risk of tumor progression ( $p = 0.782$ ) or residual tumor was observed. Nine percent of patients without endocrinopathy in the early cohort developed new endocrinopathies during the follow-up period versus 13% in the late cohort ( $p = 0.782$ ). No resolution of endocrine dysfunction was observed in either early group or late group since original presentation.

## CONCLUSION

There appears to be no difference in risk of radiographic progression of sub-totally resected nonfunctioning pituitary macroadenomas in early GKRS compared to management followed by late radiosurgery. Our data suggests that delaying radiosurgery may not pose a risk of long-term adenoma progression or significantly affect the rate of delayed endocrinopathy in patients if intervention occurs within three years.

# Understanding the Influences Surrounding Iron Deficiency in Infants (6-10 months)

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## INTRODUCTION

Although pediatricians counsel parents on best feeding practices for infants as they develop in order to limit micronutrient deficiency, iron deficiency remains one of the most common nutrient deficiencies of infancy. Prior research has studied the influences, including family and social circles, surrounding the introduction of complement foods in infants. Complement foods are foods other than breast milk and formula and are expected to provide additional nutrients in the infant's diet. Research has shown that parents are likely to receive information about introducing complementary foods to their infant from family members, books and the Internet. However, little is known regarding the specific influences surrounding the introduction of iron containing complement foods in infants 6-10 months of age. Due to the negative impact iron deficiency has on infants, this project seeks to understand what triggers parents to add iron containing complement foods to their child's diet.

## METHODS

A paper survey will be administered to parents at Orchard Pediatrics in West Bloomfield, Michigan while in the waiting room before their infant's 2-month, 4-month, 6-month or 9-month well-baby visit. The survey will consist of a series of close-ended questions that will elicit information pertaining to influences surrounding feeding practices, as well as demographic and infant diet (and/or planned infant diet) questions. The anticipated data collection time will last for a minimum of 3 months. A chi-square test will be used for data analysis.

## ANTICIPATED RESULTS

In conducting this research, it is expected that family and social circles will have the greatest influence on guiding parent's decisions on feeding practices.

## CONCLUSION

The results are expected to support the hypothesis that family and social circles will have the greatest influence on guiding feeding practices. This information will be valuable to healthcare providers, as it will inform better methods of disseminating information pertaining to feeding practices.

# Assessing Knowledge of Sickle Cell Trait/disease Inheritance in the Metro Detroit Area

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## INTRODUCTION

Sickle cell disease (SCD) is an autosomal recessive disease associated with life threatening complications. It is genetically inherited and not specific to one race. Increased migration to the U.S. and interracial marriages in the U.S. could enhance sickle cell trait distribution in the population over time. This study aims to assess knowledge about the inheritance pattern of sickle cell disease among college students.

## METHODS

An electronic survey was administered to college students at Oakland University, and Oakland University William Beaumont (OUWB) School of Medicine. The primary analysis compared knowledge of sickle cell disease inheritance pattern between different demographic categories (i.e. gender, education and age). Each of the knowledge questions was categorized as yes/no. Categorical variables were compared using Chi-square tests and/or Fishers Exact test. Continuous variables were analyzed with a two-sample t-test.

## RESULTS

A total of 146 people responded to the survey, of which 106 (27.4%) were Oakland University undergraduate students and 40 (72.6%) were OUWB students. In total, three participants - 1 white, 1 Asian and 1 African American, reported knowing that they have sickle cell disease/trait. Also, one white female participant reported having an infant carrying the sickle cell trait. Most respondents (95.9%) know that sickle cell disease/trait is genetically inherited, but a majority believe that it is a disease associated only with African-Americans (67.8%). Lastly, most participants (75%) think people should know if they have sickle cell trait before marriage.

## CONCLUSION

The result shows that most participants believe sickle cell disease is specific to African-Americans. However, because all races are equally likely to inherit this disease, knowing one's status could help prevent sickle cell-related deaths during rigorous exercises and enable individuals of reproductive age to make informed marriage decisions in order to decrease sickle cell disease prevalence, and it's associated psychosocial burdens.

# Patient Satisfaction and Quality of Life after Robotic Sacrocolpopexy for Pelvic Organ Prolapse

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## INTRODUCTION

The use of robotic sacrocolpopexy (RSC) for the treatment of pelvic organ prolapse has been increasing since it was first used in 2004. RSC is believed by surgeons to be one of the safest and most effective surgical therapies available, yet surgeons have been primarily concerned with anatomical outcome for prolapse surgical repair techniques, rather than functional outcome, including patient satisfaction. Investigating overall patient satisfaction, quality of life (QoL), and complications for both short and in the long-term will elucidate a patient-centered approach to medicine that has been lacking. This study aims to assess patients who underwent RSC in a holistic manner and investigate outcomes related to the patient's overall QoL.

## METHODS

This study will analyze validated questionnaire data and chart review data collected as part of the Urology Database Project. Since not all women undergoing RSC enroll in the Prolapse Database, additional patients that had RSC will be identified and assessed through the author's practice. These patients will receive a mailed survey to assess satisfaction and QoL. If the survey is not returned within 2 weeks, patients may receive a second mailing or a phone call to make sure they have received the survey. The medical records of the additional patients not enrolled in the Prolapse Database will also be reviewed for medical surgical history data, operative details, and postoperative information.

## ANTICIPATED RESULTS

Using validated questionnaires and global assessment the treatment group is expected to have overall improvement in patient satisfaction and QoL measures.

## CONCLUSION

These results are expected to support the use of RSC over other modalities, specifically from the aspect of improvement patient care, patient QoL and satisfaction, and decreased side effects with an emphasize placed on long-term outcomes. This may help surgeons and clinicians to better use a modality that fits with the patients needs.

# Factors Associated with 30-day Readmission Rates Following Total Hip and Knee Arthroplasty

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## INTRODUCTION

In order to improve patient outcomes and reduce cost burden, hospitals and clinicians alike have investigated potential factors associated with elective Total Hip Arthroplasty (THA) and Total Knee Arthroplasty (TKA) readmissions. However, many studies have focused their approach on specific demographics or did not assess valuable factors. We aim to execute a more comprehensive evaluation of the patient factors, surgical factors, and comorbidities potentially related to 30-day readmit rates to improve treatment and reimbursement.

## METHODS

This study will be a retrospective cohort analysis evaluating elective THA and TKA readmissions over a six-year period (January 1, 2010 – January 1, 2016). A univariate analysis will be conducted between patients readmitted (treatment) and those not readmitted (control) who received elective TKA or THA through Beaumont Health System. Comparison of the continuous variables between the two groups will be done through a standard t-test. In addition, categorical variables of the two groups will be compared through a chi-square test. Utilizing the data identified as significant from the univariate analysis, a logistic regression analysis may be used to predict the risk factors of readmission following elective THA or TKA.

## ANTICIPATED RESULTS

Upon analysis, it is expected that readmitted patients will present with certain risk factors significantly more often than the control group. Comorbidities, surgical factors, and patient factors such as diabetes, surgical site infections, and advanced age, are some of the anticipated factors to increase risk of readmission.

## CONCLUSION

The results are expected to add insight into what factors impact 30-day readmit rates and potentially improve patient treatment and outcomes with total knee and hip arthroplasty.

# Analysis and Optimization of Drug Dosing Parameters within Epic EMR

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## INTRODUCTION

Computerized Provider Order Entry (CPOE) entry systems with clinical decision support (CDS) are an intrinsic part of electronic medical records (EMR) and in particular can help improve patient safety and quality of care by alerting healthcare providers when a certain dosage of medication may lead to adverse events. However, drug dosing parameters that come standard with EMRs are too sensitive and not specific thus leading to over generation of alerts and alert fatigue. This study looks to establish how often drug dosage alerts are firing and by what amount physicians are exceeding the dosage guidelines.

## METHODS

Drug dosing alerts were taken from Beaumont EMR for 2016. Each alert was categorized based on whether they exceeded single, daily or frequency doses and then sorted by how much (percentage wise) they exceeded the recommended dose. The data is subsequently analyzed to see the threshold where the majority of drug orders are exceeding the recommended dose and generating alerts. This percentage point then becomes the basis for optimization of drug dosing parameters and reducing alerts.

## ANTICIPATED RESULTS

Analysis is anticipated to show that drug orders that exceed the recommended dose and generate an alert will have a Bell curve distribution. The midpoint of this graph will represent the threshold that is more specific for high risk adverse drug events and will become the basis for future drug dosing parameters.

## CONCLUSION

The results are expected to support the hypothesis that current drug dosing parameters are too numerous and stringent leading to alert fatigue without a proportional increase in patient safety. Setting higher drug dosing thresholds which will fire only in cases of significant patient harm, this will limit the number of alerts and reduce healthcare professional alert fatigue.

# Bipolar Transurethral Resection of the Prostate Feasible as Outpatient Surgery

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## INTRODUCTION

Benign prostatic hyperplasia (BPH) is one of the most common conditions affecting older men. Notably, around 50 percent of men between ages 50 and 60 demonstrated evidence of BPH. Although generally characterized as benign, the disease can tremendously reduce quality of life because of the associated effects on urinary function. Transurethral resection of the prostate (TURP) has widely been considered the gold standard in surgical treatment of BPH. While effective, the procedure still requires inpatient hospital admission to monitor postoperative hematuria and voiding characteristics. Few studies have presented alternative therapies to treat BPH in an outpatient setting. Here, length of hospital stays following Olympus PlasmaButton and PlasmaLoop therapy will be compared against conventional TURP. The study hopes to suggest an improved methodology to reduce hospitalization rates following surgical management of BPH.

## METHODS

A retrospective chart review was performed on 104 patients who fulfilled study criteria. All underwent Olympus PlasmaButton and PlasmaLoop therapy between 2011 and 2014 at one of three surgical centers in Metropolitan Detroit. These included Beaumont Royal Oak and Troy, as well as the Michigan Institute of Urology. Mean hospital stay was examined and compared to existing studies using 2 sample t-test.

## ANTICIPATED RESULTS

During a 3-year period, 85 out of 104 (82%) required no hospitalization and were discharged on day 0. After data analysis is complete, it is anticipated the mean hospital stay in hours will be lower using combination Olympus PlasmaButton and PlasmaLoop therapy, compared to conventional TURP.

## CONCLUSION

Preliminary results suggest that combination Olympus PlasmaButton and PlasmaLoop therapy offers an alternative to conventional TURP procedures, which generally require inpatient hospital admission. Based on data presented, future implications may include transitioning of BPH treatment to an outpatient setting.

# Homogenization of the Mechanical Bidomain Model of Cardiac Muscle

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## INTRODUCTION

This paper aims to review the mathematical properties of the bidomain model of a cardiac tissue at cellular level. Previous mechanical bidomain models help predict where mechanotransduction takes place in the heart. We hope expanding this model we will lead to a better understanding of the remodeling of cardiac tissue during insults such as ischemic attacks.

## METHODS

An important problem in creating a mechanical model is explaining intracellular and extracellular displacement ( $\mathbf{u}$  and  $\mathbf{w}$  respectively) in terms of the physical properties of this tissue. To do this we will be focusing on the properties of cardiac muscle and look into how these equations can be extrapolated to explain the behavior at the cellular level. In particular, we will study how the intracellular and extracellular pressures ( $p$ ,  $q$ ), intracellular tension ( $T$ ), Young's modulus along the fibers ( $Y$ ), Intracellular and extracellular shear modulus ( $\mu$ ,  $\nu$ ) and spring constant coupling the two spaces ( $K$ ) at the tissue level can be expressed in terms of properties at the cellular level.

## ANTICIPATED RESULTS

We expect to generate a model that predicts the behavior of a cardiac muscle at the cellular level and see its relation to the mechanical properties of the whole tissue.

## CONCLUSION

Similar mathematical models in other fields, such as those describing the electrical properties of cardiac tissues, have allowed for the innovation of pacemakers. The models we are creating have the potential of becoming a mathematical tool useful in medical.



# Determining Reasons for Low Human Papillomavirus Vaccination Rates Among Homeless Mothers

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## INTRODUCTION

Every year, human papillomavirus (HPV) infects an estimated 14 million people in the US. High-risk subtypes are linked to many types of cancer, particularly cervical cancer in women. Low-income women have disproportionately 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

25 female residents from Lighthouse PATH who self-report that they have not received the HPV vaccine took surveys on HPV and the HPV vaccine, administered on site. The survey included true/false, 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 was reviewed for trends using appropriate statistical analysis.

## ANTICIPATED RESULTS

It is expected that Lighthouse PATH residents will identify multiple barriers to care in receiving the HPV vaccination, including lack of transportation, mistrust in healthcare providers, difficulty getting time off of work, and lack of HPV knowledge.

## CONCLUSION

The results are expected to identify a gap in HPV knowledge and barriers to receiving the HPV vaccine.. Once identified, Lighthouse can provide targeted health information to address key participant concerns, providing a cost-effective way to increase HPV vaccination rates to lower the risk of HPV-related cancers, and ultimately improving accessible healthcare to Lighthouse's residents.

# Cardiac Manifestations of Acute and Chronic Hyperkalemia

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## INTRODUCTION

Hyperkalemia occurs in up to 8% of hospital admissions and those most at risk are individuals with compromised kidney function. The severe and most feared consequence of hyperkalemia is a cardiac rhythm abnormality, in particular asystole. Electrocardiography (ECG) is an initial step in identifying patients with potassium-induced cardiac electrical abnormalities. We postulate that patients with chronic hyperkalemia from severe chronic kidney disease become desensitized to high serum potassium, show fewer ECG changes, and by inference have less dangerous arrhythmias than patients with acute hyperkalemia typically from acute kidney injury. This study aims to 1) determine incidence of ECG changes in all patients presenting with hyperkalemia and 2) test whether there is a difference in incidence and threshold of hyperkalemic ECG changes in the settings of chronic hyperkalemia from severe chronic kidney disease versus acute hyperkalemia.

## METHODS

200 adult patients admitted to the Beaumont Hospital Royal Oak with a primary or secondary diagnosis of hyperkalemia will be placed into two study groups; those with baseline chronic hyperkalemia from end-stage renal disease (ESRD) and those with acute hyperkalemia without ESRD. ECGs obtained from each patient at the time of the hyperkalemic episodes will be assessed for hyperkalemia-related changes by a single blinded observer. The overall incidence of ECG changes among all study participants will be measured and the two groups will be assessed for differences in incidence of ECG changes using unpaired t-tests and multivariate analysis.

## ANTICIPATED RESULTS

The results are expected to show a lower incidence of ECG changes in chronic hyperkalemic ESRD patients versus acute hyperkalemic non-ESRD patients.

## CONCLUSION

The results are expected to help better understand the hyperkalemic patient populations most at risk for arrhythmias, and may lead to earlier identification and appropriate prophylactic treatment of select patient groups with hyperkalemia.

# Establishing a Correlation Between Electroencephalography Length and Positive Clinical Findings in Pediatric Neurology

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## INTRODUCTION

Electroencephalography (EEG) is a routine test in the setting of neurology. An EEG can vary from 20 minutes to more than 90. The current EEG guidelines from the American Clinical Neurophysiology Society (ACNS) are quite minimal for both adult and pediatric patients. For adult patients, guidelines suggest simply 20 minutes. For pediatric EEGs, no guidelines are stated except for neonates, which recommend at least 60 minutes due to greater movement in these patients. Due to these minimal guidelines, physicians tend to set the EEG length based on personal preference. This potentially leads to wasted time and resources spent analyzing nonessential data. The goal of this study is determine if there is a correlation between length of EEG and positive clinical findings. An absence of such findings would suggest the proposal for more specific guidelines from the ACNS.

## METHODS

300 pediatric patients will be randomly selected from a population that received an EEG within the last three years from the Beaumont Health System. The length of the EEG and presence of positive or negative findings will be recorded. Additional information such as age, race, weight and other characteristics will also be recorded for possible further analysis. The positive and negative finding groups will be evaluated to determine any variations between groups and the patient data set as a whole.

## ANTICIPATED RESULTS

Patients that received a shorter EEG are expected to have the same likelihood of significant positive findings as those that received a longer one.

## CONCLUSION

The results are expected to support the hypothesis that there is no correlation between the length of EEG and positive findings in pediatric patients. This would support the notion for more explicit and specific EEG guidelines for pediatric patients from the ACNS.

# Parents' Perception of Health Benefits Associated with Participating in a School-based Gleaners' Mobile Food Pantry Program

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## INTRODUCTION

Gleaners' Food Bank in Detroit has transformed their Backpack Program into one that is more effective for the facility and the families they serve. The changes addressed issues such as children feeling targeted by their peers, feeling self-conscious of their family's financial situation, backpacks being heavy, and finally, fresh fruits and vegetables could not be distributed effectively.

The Mobile Food Pantries were developed so that parents can pick up monthly shipments to replace the weekly backpacks students carried home with the old program. Gleaners' provides Pontiac High School with monthly deliveries of fresh fruits, vegetables, and protein products, giving families more food per month that has higher nutritional value. The purpose of this project is to evaluate how the parents of the families participating in this program perceive the benefits of fruits and vegetables, to evaluate their satisfaction with the program, and to evaluate if the participants are utilizing the products they are given.

## METHODS

Participants of the Mobile Food Pantry at Pontiac High School will be asked to complete a survey questionnaire to evaluate how they perceive the impact of fruits and vegetables on their health. It is expected that 15-25 people will return the surveys and each receiving a \$5 gift card to compensate for their time spent filling out the survey questionnaire. The study will have a cross-sectional design.

## ANTICIPATED RESULTS

It is expected that the results of this survey will help the Mobile Food Pantry to better serve the nutritional needs of students and families to support their health.

## CONCLUSION

The results are expected to help the Mobile Food Pantry become a more inclusive and reliable recourse for families in the future. This program impacts families in our community by helping them live happier and healthier lives with access to fresh food alternatives.

# Electroencephalogram Analysis Coordinating Brain Waves with Specific Hand Movement

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## INTRODUCTION

Robotic limb prostheses for amputees has become more common following loss of function in clinical treatment and rehabilitation to normal life. In recent years, these replacements have gained more functionality but research lacks a definitive correlation between brain wave activity and muscular response. Our research will attempt to distinguish a change in brain wave activity, using encephalogram technology, to determine whether electrical potentials can be indicative of evoked physical movement within the body. The overarching goal of this research is to produce a robotic hand that can respond appropriately to mental stimuli.

## METHODS

10 second-year medical students from a suburban medical school will be asked to volunteer for data collection. Each subject will undergo specific hand movements while a headband-detector will measure brain wave frequencies. The brain wave measurements will include a stationary finger, finger flexion and extension, and making a fist. A stationary finger, acting as a control, will be compared to the specific hand movements, acting as experimental data, to provide differences in terms of frequency (measured in hertz) and amplitude (measured in volts) of the electroencephalogram waves.

## ANTICIPATED RESULTS

When subjects are asked to move their finger, we are expecting to collect brain waves with a higher frequency and amplitude than a stationary hand in which there is no mental anticipation of movement.

## CONCLUSION

The results should show more brain wave activity during the finger movement exercises than during the non-movement controls. This would be supportive of measurably increased brain activity associated with physical movements that could be analyzed and applied to further applications within mental control of robotic limb prostheses.

# Predicting Post-Stereotactic Body Radiation Therapy Pulmonary Function Loss in High Pulmonary Risk Lung Cancer Patients

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## INTRODUCTION

Lung cancer is the leading cause of death in the United States. Stereotactic body radiation therapy (SBRT) in the Radiation therapy Oncology Group 0236(RTOG 0236) trial, achieved a 3-year survival of 90.6% for stage 1 lung cancer in surgically inoperable patients compared with 40% for conventional radiation therapy. However, RTOG 0236 also noted 14.5% of patients experienced grade 3 or 4 respiratory toxicity. Unlike pulmonary risk assessment used for thoracic surgery, there is no method to assess lung function post-SBRT. The current research hopes to fill the void and provide radiation oncologists with tools to assess lung toxicity post SBRT treatment.

## METHODS

Pre-treatment 4D-CT scans of inhale and exhale was segmented to identify the lung parenchyma. Deformable image registration was applied to map each inhale voxel to the corresponding exhale phase voxel. Following which a 4D spatial map of ventilation was calculated using a density change based approach dosage was then superimposed on ventilation to visualize area of treatment. To determine the effect of radiation therapy, the dosage plan on ventilation was multiplied. This allows the evaluation of post-SBRT lung function. After which correlation between predicted SBRT forced expiratory volume in 1 second (FEV1) from our mathematical model and those obtained from spirometry, was tested using Pearson correlation coefficient.

## RESULTS

Correlation from Pearson correlation between FEV1 obtained from our model and spirometry is 0.99. The empirically derived lambda value utilized to predict post – SBRT in our lung function model is  $\lambda = 4.30 \times 10^{-3}$  with a standard error of mean of 0.004.

## CONCLUSION

The correlation from our current data set is 0.99. This suggests that utilization of our model can predict post SBRT toxicity with high degree of accuracy in surgically inoperable patients undergoing SBRT.

# Evaluating the Efficacy of Open versus Robotic Retroperitoneal Lymph Node Dissection for Treating Testicular Cancer

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## INTRODUCTION

The incidence of testicular cancer in young men is among the highest when compared to all other solid organ malignancies. Fortunately, the therapeutic modalities utilized for testicular cancer can offer major help in reducing the mortality 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 treating testicular cancer. Recent case series have shown benefits of using Robotic RPLND over Open RPLND for testicular cancer treatment and hence, we believe that it is warranted to compare the two interventions for their efficacy in treating testicular cancer.

## METHODS

In this study, we will retrospectively compare perioperative outcomes such as blood loss, length of stay, recovery time, operative time, and ejaculatory complications in testicular cancer patients that had undergone Open versus Robotic RPLND. We will also compare oncologic outcomes such as Lymph Node (LN) yields, LN positivity, % needing chemotherapy, and recurrence rate/time between the two groups. Categorical variables will be compared using Chi-square tests and continuous variables will be analyzed using a two-sample t-test. The log-rank test will be used to compare the recurrence times between the groups.

## ANTICIPATED RESULTS

We anticipate that patients that had undergone Robotic RPLND would have better perioperative outcomes and similar oncologic outcomes when compared to Open RPLND cases.

## CONCLUSION

This study will provide a statistical and scientific basis for implementing changes in the current practice for managing patients with testicular cancer.

# **Ballroom Dance and Its Relationship with Perceived Social Health**

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## **INTRODUCTION**

Dance therapy has been shown to have positive physical, psychological, and social outcomes for certain populations. For example, dance intervention has been shown to provide positive results for elderly populations in the areas of flexibility, strength, balance, cognitive ability, and cardiovascular endurance. However, prior research is limited in scope and has not looked at social health effects of long-term dancing. Social health refers to the health of relationships with others. This study will assess participants' length of time attending a ballroom dance club and time per week spent dancing. This data will then be compared to participants' perceived social health to reveal any possible relationships. The objective of this study is to investigate the relationship between ballroom dance club attendance and perceived social health.

## **METHODS**

This study is exploratory and cross-sectional. A survey will be administered to a convenience sample of participants recruited from attendees of the ballroom dance club at the University of Michigan. Only attendees age 18 and over will be invited to participate. The survey will consist of demographic items, quantitative items related to dance habits, a qualitative exploratory item, and a perceived social health tool. Statistical analysis will be performed using SAS to find correlations and relationships.

## **ANTICIPATED RESULTS**

Surveys are expected to be completed by approximately fifty individuals. Results are expected to show perceived social health vary with length of time attending the ballroom dance club.

## **CONCLUSION**

Results from this study may help in understanding the long-term social health effects of ballroom dance. Results may support the use of ballroom dance therapy for improving social health of individuals, or as part of wellness programs to improve patient outcomes.



# The Genetic Link between Chronic Lymphocytic Leukemia and Hairy Cell Leukemia

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## INTRODUCTION

Chronic lymphocytic leukemia (CLL) is a disorder of excessive B lymphocytes and is the most common lymphoid malignancy in Western countries. The course and prognosis of CLL is highly variable with the most severe complications being related to infection or autoimmune issues. Hairy cell leukemia (HCL) is also a disorder of excessive B lymphocytes with the most important risk of weakening the immune system of the affected individual which could lead to deadly infections. This study aims to make a familial genetic correlation between CLL and HCL, a correlation that has not yet been described.

## METHODS

Using buccal swab samples previously collected, we will look for large deletions, trisomies, or translocations that can be made apparent by genome-wide DNA profiling. The mir15a/16-1 gene (a tumor suppressor gene) will be assessed for single nucleotide polymorphisms by DNA sequencing and/or RT-PCR in both patients and family members. A mutation in this gene can cause excessive proliferation of cells and could be a cause of CLL/HCL. A genome-wide array will be used to determine the loss/mutation of tumor suppressor proteins common to both patients and in unaffected family members.

## ANTICIPATED RESULTS

We hypothesize that the unifying genetic abnormality correlates with a 13q14.3 deletion and the mir15-1/16-a gene that is lost with such a deletion. This study has the potential to corroborate the presence of an altered mir15a/16-1 in CLL. It also has the potential to produce a novel finding that defines a familial connection between CLL and HCL.

## CONCLUSION

In identifying this familial connection, better diagnostic information and risk stratification will be gleaned from the results of this study. If a correlation is made and the connection is identified, it may also lead to novel ways to treat the diseases presented and allow a better understanding of the cause of these diseases.

# Lens Pattern as a Marker for Increased Risk of Development of Diabetes Mellitus Type 2

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## INTRODUCTION

The tests used to screen for Diabetes Mellitus Type 2 (DM2) are the same as the tests used for diagnosis. For this reason, DM2 frequently goes undiagnosed until complications begin to appear. Thus, there is room for improvement with respect to identifying patients at risk for developing DM2 before they begin to show symptoms of the disease. The primary goal of this study is to establish preliminary evidence that a particular benign lens finding is correlated with DM2. This study may inform future studies that assess the lens pattern and its potential link to DM2 in greater detail.

## METHODS

Participants will be selected from first-time visitors to The Brimhall Eye Center in Las Vegas, Nevada that have received a previous diagnosis of Diabetes Mellitus Type 1 (DM1) or DM2. The DM1 patients will serve as a control group. An ophthalmologist, blinded to the participant's diagnosis (DM1 or DM2), will then observe the participants eyes via slit lamp and grade the pattern on a scale of 1 (no pattern) to 3 (obvious pattern). The various relationships within and between the two groups will be analyzed for various events and other variables collected, including the primary outcome (lens pattern), using appropriate parametric and non-parametric methods.

## ANTICIPATED RESULTS

It is expected that the lens pattern will be detected with significantly greater frequency in DM2 patients compared to DM1.

## CONCLUSION

The results are expected to support the hypothesis that the lens pattern is correlated with DM2. This suggests that the link is due to some factor unrelated to diabetes-mediated damage. This could potentially open the door for future discoveries in the field of diabetes research.

# HIV/AIDS Education Workshop: A Pilot Study

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## INTRODUCTION

Human Immunodeficiency Virus (HIV) causes an infection affecting the immune system that can eventually lead to acquired immunodeficiency syndrome (AIDS) if untreated. During 2013, in Southeastern Michigan, 523 people were newly diagnosed with HIV, and upon diagnosis 59% were found to be already at stage three, the AIDS disease stage. In order to detect individuals earlier and decrease transmission, community-based interventions and education are critical. The primary goal of this study is to perform a targeted workshop and determine its effectiveness at increasing knowledge and decreasing stigma surrounding HIV/AIDS. Secondary goals are to increase participants' awareness and provide recommendations for best practices in HIV education.

## METHODS

This study uses a pre- and post-test design with an educational intervention that takes place in Pontiac, MI. The workshop consists of two components, an education and an interactive component. The education component focuses on how HIV is spread, treatments available, and prevention strategies. The interactive component consists of prompting participants to focus on an HIV positive person's perspective, role-playing and discussions about possible ways of contacting HIV or people affected by HIV. Prior to the session a pre-workshop survey is administered and at the conclusion of the session a post-workshop survey is administered. The score from pre-workshop and post-workshop surveys will be compared using a one-sample paired t-test. Other categorical data will be analyzed using counts, percentages, and confidence intervals.

## ANTICIPATED RESULTS

Knowledge regarding HIV/AIDS is expected to increase and stigma is expected to decrease.

## CONCLUSION

Results are expected to support the hypothesis that education interventions are affective. By providing an effective model for HIV education, best practices can be recommended for future educational interventions.

# Attitudes and Perceptions of Healthcare Providers Regarding Safe Reduction of Cesarean Section

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## 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, specific Beaumont hospital, multiple hospital system 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.

# Evaluating the Provision of Dispatch-Assisted Cardiopulmonary Resuscitation Using a Cardiac Arrest Registry

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## INTRODUCTION

Dispatch-assisted cardiopulmonary resuscitation (DA-CPR) has been shown to improve rates of bystander CPR (BCPR) and survival in select communities. Performance standards for dispatch agency performance have been proposed but not externally validated. Our objectives are: to determine whether DA-CPR is associated with improved patient survival, and to compare performance by a sample of dispatch agencies to formerly-set standards.

## METHODS

We reviewed dispatch data from audits of audio recording of out-of-hospital cardiac arrest (OHCA) calls in the United States from 1/1/14-12/31/15. Recordings were reviewed by agency supervisors and entered into a national database. Temporal elements, operational and logistical barriers to DA-CPR instruction, and text comments were recorded (multiple dispatcher comments per case). Multivariate analysis was performed.

## RESULTS

For our primary objective, we identified 2674 cases from 28 dispatch agencies in 9 states of OHCA with dispatch and outcome data. As expected, survival was improved with CPR provision on scene (BCPR 17%; DA-CPR 12%; No BCPR, 8%). In a multivariable analysis, BCPR was associated with significantly improved survival (OR=1.50, 95% CI 1.04, 2.08), and DA-CPR a non-significant improvement in survival (OR=1.20, 95% CI 0.88, 1.64).

For the second objective, we identified 1983 cases eligible for DA-CPR instructions. Dispatchers recognized cardiac arrest in 83.1% cases; median (IQR) time to recognition 80 (58, 120) sec, with 32.0% calls recognized in <60 seconds; DA-CPR instructions were initiated in most cases with compressions initiated in 74.0%; median (IQR) time to DA-CPRi was 180 (130, 240) seconds and was performed within two minutes of call in 21.4% of cases.

## CONCLUSION

In this convenience sample of dispatch cases, OHCA was frequently recognized and DA-CPR performed but was not associated with a significant improvement in survival. Furthermore, temporal measures of dispatch performance were substantially below proposed national standards.

# Q10 – Temperature Effects on Voltage Gated Ion Channels

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## INTRODUCTION

In the current literature, ion channel studies are often conducted at lower temperatures than normal physiologic temperatures. To account for this gap, researchers utilize the widely accepted Q10 model (derived from the Arrhenius equation) to extrapolate the values they acquired to what would be expected at physiologic temperatures. The primary goal of this study was to identify the validity of the Q10 model based on the current literature suggest changes to its implementation to better reflect the physiology.

## METHODS

Numerous articles were synthesized in this study to show a general trend regarding the use of Q10 in the current literature. After analyzing the data of previous literature, we gathered the information to create a graph to visualize the efficacy of the current Q10 model and compared the values researchers were displaying in their papers against the values we calculated using the appropriate equations. Thereafter, we created a model that would enable future researchers to better extrapolate their values.

## ANTICIPATED RESULTS

It is expected that articles in current literature are not accurately reporting/utilizing the Q10 model and it is probable that a better equation can be created.

## CONCLUSION

The results are expected to support the hypothesis that the Q10 model is not being used appropriately and is not effective in enabling researchers to create a standard protocol that would allow them to extrapolate their results to physiologic temperatures for voltage gated ion channels.

# Cost Savings and Healthcare Chaplaincy in a Cardiac Patient Population

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## INTRODUCTION

Spiritual care can be an important part of the patient experience during progression through illness and recovery by aiding in coping, pain, and length of hospital stay. As a result, involvement of spiritual care in the treatment of patients reduces healthcare costs. A recent study showed that end-of-life cancer patients' last week of life costs were reduced from \$5,097 to \$2,657 when spiritual needs were met. Of particular interest are cardiac patients, as they experience significant distress, depression, and lowered quality of life following diagnosis, impacting the effectiveness of treatments. The primary goal of this study is to determine whether providing spiritual care to acute myocardial infarction (MI) patients reduces the costs of care. A related hypothesis is that increased interaction with the chaplain will further improve cost outcomes.

## METHODS

Acute MI patients will be divided into control and treatment group based on whether they were visited by the chaplains during their stay in the cardiac step-down unit at Beaumont Royal Oak retrospectively from 2014-2016. Cost outcomes will be determined by comparing the following metrics: length of stay, use of pain and anti-depressant medications, and readmission rates. These data will be correlated with the number of visits by chaplaincy to determine whether this affects cost outcomes. Statistical analyses will involve paired t-tests and ANOVA.

## ANTICIPATED RESULTS

Compared to the control group, the acute MI patients who have sufficient spiritual care will incur lower total healthcare cost due to decreased length-of-stay, medication, and readmission. And, increased contact between chaplaincy and patients increases the cost savings realized by both patients and institution.

## CONCLUSIONS

The results are expected to support the hypothesis that integrating spiritual care into patient recovery from acute MI will reduce costs incurred by patients. And, number of visits will be associated with a stronger cost reduction.

# Perioperative Risk Factors for Post-Op Urinary Retention After Elective Spine Surgery

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## INTRODUCTION

Postoperative Urinary retention (POUR) is a common complication following spinal surgeries. Urine retention is characterized by difficulty of voluntary urination for hours or days after elective surgeries. The incidence of POUR is about 5-13%. This retention could cause discomfort in patients accompanied by pain and pressure due to bladder distension. Patients need catheterization in order to release urine, which might cause additional inconvenience especially if they are discharged home with these catheters. Studies have suggested that urine retention could develop due to different factors like age, duration of procedure, type of procedure, concomitant medications (Ex. Anticholinergic), comorbidities and more. However, there is no consensus about the direct causes of POUR. The primary goal of this study is to determine risk factors that might lead to POUR.

## METHODS

Data were extracted from 2000 patients who underwent elective spinal surgery at William Beaumont hospital-Royal Oak from January 2014 to January 2016. Data included age, duration of procedure, type of procedure, concomitant medications, type of catheter used during the operation, number of catheters used, preoperative diagnosis of benign prostatic hyperplasia, history of urinary tract infection and comorbidities. Development or lack of development of urine retention was noted for each patient. A statistician, to determine if these factors are significant in developing urine retention after the surgery, will analyze data.

## ANTICIPATED RESULTS

Urine retention is expected to develop with people, who are older, had a history of benign prostatic hyperplasia, urinary tract infection and other comorbidities. It is expected that those who take anticholinergic medications will have a higher chance of developing POUR. In addition, it is also expected that the longer the duration of elective spinal surgery, the higher the chance of developing POUR.

## CONCLUSION

The results are expected to support the hypothesis that pre-existence of risk factors mentioned above will increase the chance of developing postoperative urinary retention.



# Pseudocyst Assessment and Characterization in Dry Age-Related Macular Degeneration with Geographic Atrophy

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## INTRODUCTION

Age-related macular degeneration (ARMD) is a disease of the retina in which there is progressive deterioration of the retinal pigment epithelium. This study specifically focuses on the dry form of ARMD, and its relation to geographic atrophy (GA) and pseudocyst development. Dry ARMD is poorly understood, with GA marking its advanced, end-stage form. This condition is very common in the elderly, and a major cause of blindness worldwide (yet without definitive treatment). New technological advancements in retinal scanning—such as Optical Coherence Tomography (OCT) Angiography—in addition to current OCT scanners serve to better visualize the retina. Thus, this project aims to identify patients with pseudocysts in GA stage of dry-ARMD using OCT scans, observe them over time, and determine if cyst characteristics vary with demographics.

## METHODS

120 patients will be selected for the study, specifically their Spectralis Spectral Domain (SD)-OCT and OCT-Angiography scans. Variables include diagnosis, age, sex, race/ethnicity, smoker vs nonsmoker, and imaging. Frequency and descriptive statistics will be performed for every variable, and a chi-square analysis will be performed on the sex variable. A paired t-test will be performed, comparing the pseudocysts from earlier scans to follow up scans, determining potential changes in pseudocyst characterization. The changes will then be correlated to demographics.

## ANTICIPATED RESULTS

The pseudocysts are expected to vary in size, shape, depth, and location. We expect Caucasians to have the highest prevalence of GA and pseudocysts, women to have higher prevalence than men, and smokers to have higher prevalence than non-smokers. Additionally, we anticipate that the pseudocysts will change in morphology and depth over time.

## CONCLUSION

Characterization of the cysts would give us further insight into the pathophysiology of pseudocystic changes in GA. This holds substantial implications from both a pathophysiologic and patient treatment care and follow up perspective.

# Incidence of Bacteremia in Newly Diagnosed Acute Leukemia Patients Presenting with Fever

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## INTRODUCTION

A common presenting symptom of acute leukemia in pediatric patients is fever. In the setting of a patient who is receiving chemotherapy and has a central line, fever may be associated with bacteremia. This study aims to elucidate the correlation between a newly diagnosed, febrile acute leukemia patient and whether that fever is related to the disease presentation or bacteremia. In addition, this study also seeks to analyze if the treatment plan was adjusted after a patient presented with fever and/or bacteremia.

## METHODS

This study will analyze nearly 100 pediatric patients with acute leukemia in a retrospective chart review. Using the Epic electronic record in the Beaumont Health System, patient data will be collected including: temperature upon presentation, blood culture results, date of central line placement, date of bone marrow biopsy, and treatment, including whether systemic antibiotics were administered. Treatment will be compared for those who had fever compared to those who did not to determine any difference in treatment (e.g. delay of central line placement and initiation of chemotherapy).

## ANTICIPATED RESULTS

It is anticipated that there will be a low frequency of newly diagnosed patients (<1-5%) with bacteremia as the cause of their presenting fever. It is also anticipated that patients who had fever at the time of central line placement did not have increased incidence of bacteremia in the two weeks following line placement.

## CONCLUSION

The results are expected to support the hypothesis that acute leukemia patients who present with fever are febrile more likely as a symptom of the cancer, not because of a simultaneous bacterial infection. These results may support a change in practice such that a patient should not have unnecessary delays in central line placement and initiation of chemotherapy pending blood cultures. Also, unnecessary exposure to broad spectrum antibiotics may be avoided.

# Caregiver Disclosure of Illness Status to Children with Malignancies at Beaumont Royal Oak

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## INTRODUCTION

Pediatric oncology guidelines encourage child participation in their own care in developmentally-appropriate levels. However, primary caregivers often resist disclosing medical information to pediatric patients due to perceived negative emotional effects, leading to decreased child participation. The primary goal of this study is to determine the extent of disclosure of medical information by caregivers to pediatric oncology patients, and to determine variances accounted for by parent and child demographics, child health-related quality of life, and parental behavioral factors (depression, anxiety, experiential avoidance, miscarried helping about health, and quality of family environment).

## METHODS

Eligible primary caregivers will be determined by identifying children with oncologic disorders at Beaumont Royal Oak. These caregivers will be recruited via flyers distributed during clinic visits or hospitalizations. Primary caregivers that agree to participate will complete a 139 question online survey that takes approximately 25-30 minutes. This survey consists of several questionnaires designed to investigate variables of interest.

## ANTICIPATED RESULTS

Pilot data of this study from the University of Michigan Health System found statistical correlations between several psychosocial variables and level of disclosure. Caregiver depression was associated with decreased disclosure. Caregiver tendency to avoid negative internal emotions was associated with the view that their child was “too young” to handle disclosure regardless of their child’s age. Importantly, several positive outcomes (including lower parent and child distress, increased child-initiated communication, and greater desire for child participation in their care) were associated with increased levels of disclosure. The Beaumont Royal Oak leg of this study, consisting of an estimated 50 caregivers, is anticipated to expand the sample size and solidify similar correlations.

## CONCLUSION

The results are expected to demonstrate the positive outcomes associated with caregiver-child disclosure. Variables that are correlated with less disclosure can be identified and managed more appropriately by physicians in hopes of increasing levels of healthy disclosure.

# The Impact of Anesthesiologist Pre-op Visits on Patient Fears of General Anesthesia

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## INTRODUCTION

Patients undergoing surgery have fears about the risks and complications of general anesthesia. Previous studies have demonstrated that patients want to see their anesthesiologist before surgery to address their need to be informed and be reassured by the person who will be providing them care. The purpose of this study is to determine if pre-operative anesthesiologist visits reduce common patient fears of general anesthesia in a surgical outpatient population. A second objective is to determine if the attire of an anesthesiologist impacts the reduction of fear of general anesthesia.

## METHODS

This study is a prospective cohort survey study that used data collected from two separate patient surveys. Study participants included adult patients who were scheduled to undergo outpatient elective surgery at William Beaumont Hospital in Troy, MI. Patients were selected at random until a total number of 50 patients completed both surveys. Survey A was administered to patients before the pre-op anesthesiologist visit, and survey B was administered to patients after the pre-op visit. In both surveys, the patient assessed general anesthesia concerns using a 5-item Likert scale (strongly disagree, disagree, neutral, agree, strongly agree). Survey scores will be compared using a Paired T-Test analysis.

## ANTICIPATED RESULTS

The anticipated result for the primary outcome is a reduction in patient fears of general anesthesia after the pre-op visit. For the secondary outcome, it is anticipated that anesthesiologists wearing white doctor's coats will further allay patient fears compared to anesthesiologists dressed in scrubs.

## CONCLUSION

The results are expected to support the hypothesis that the anesthesiologist pre-op visit will reduce common patient fears of general anesthesia side effects and complications. Furthermore, it is expected that the results support the hypothesis that anesthesiologists wearing white coats will alleviate patient fears more than anesthesiologists dressed in scrubs.

# The Effect of Respite Center Socialization on the Health Conscientiousness of Homeless Individuals

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## INTRODUCTION

Hospital usage by the homeless is a complex and costly problem that has no easy solution. In an attempt to answer this growing need for continued care, post-hospital programs began to open their doors and thus, respite centers were created. Respite centers provide continued care in a different setting post-discharge in the hope that this will decrease the overuse of the hospital by homeless individuals. This study was conducted in order to understand the effect on health knowledge and the motivation for self-management of the homeless that use a respite center.

## METHODS

This study was conducted using a semi-structured interview setting with open-ended questions. The interviews were conducted at Hope Hospitality and Warming Center. The encounter with the subjects consisted of recruitment, consent, and the semi-structured interview, totaling approximately 45 minutes. Our inclusion criteria consisted of individuals that had health issues, were older than 18 years, and did not have a primary residence. Our data will be analyzed via line-by-line coding followed by categorization and memoing. This will allow us to highlight convergent themes using analytic strategy similar to grounded theory.

## ANTICIPATED RESULTS

We anticipate uncovering positive impacts on health knowledge and self-management in individuals due to their stay at a respite center. Our sample size is 17 individuals.

## CONCLUSION

The results are expected to support the hypothesis that homeless individuals at a respite center are more likely to have a better grasp of health knowledge and are more self-motivated to take care of themselves. The results will be the first to address how being in a respite center affects the health knowledge in homeless individuals. This can then impact how much education is incorporated into a respite center in addition to the medical care already given.

# Neurons over Nephrons: Contrast-Induced Nephropathy following CT Perfusion for evaluation of Acute Ischemic Stroke

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## INTRODUCTION

There remains apprehension in the utilization of intravenous iodinated contrast agents secondary to the risk of contrast-induced nephropathy (CIN). This study evaluates whether there is a greater incidence of  $\geq 25\%$  increase in baseline creatinine levels within 48-72 hours for patients with acute ischemic stroke (AIS) who underwent CT perfusion imaging versus patients with AIS who did not undergo CT perfusion.

## METHODS

This single center study retrospectively reviewed 400 patients with AIS who underwent CT perfusion and 400 patients with AIS who did not undergo CT perfusion. Baseline data collected included age, gender, and comorbidities, including smoking history. Outcomes included the presence of  $\geq 25\%$  increase in baseline creatinine levels within 48-72 hours and serum creatinine levels at days 0, 1, 2 and 3. Continuous variables were compared using a student's t test and categorical variables were compared using a chi-squared test. All statistical analysis was performed using JMP13.0.

## RESULTS

A total of 800 patients were included (400 in each group). Mean age of the control group was significantly larger than that of the CTP group (75.3 years versus 70.7 years,  $P < .0001$ ). There was no difference in the proportion of patients with  $\geq 25\%$  increase in baseline creatinine levels within 48-72 hours in the control group (39 patients, 9.8%) when compared to the CT perfusion group (42 patients, 10.5%) ( $P = 0.81$ ). Mean creatinine levels at days 0, 1, 2 and 3 did not differ between groups ( $P = 0.36$ ,  $P = 0.39$ ,  $P = 0.30$ ,  $P = 0.36$  respectively).

## CONCLUSION

In patients presenting with AIS, administration of iodinated contrast for CT perfusion imaging does not appear to increase the risk of acute kidney injury. Therefore, iodinated contrast media may not be the underlying etiology in stroke patients with acute kidney injury following CT perfusion imaging.

# A Comparison of Medical Student Engagement in DxR Clinician versus Case-Based Discussion

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## INTRODUCTION

In the current medical school curriculum, there is ongoing need to pioneer novel teaching methods to encompass expanding content knowledge and integrate student engagement. Medical students are subjected to a variety of teaching modalities in their pre-clinical and clinical years. DxR Clinician is an interactive digital tool that utilizes real patients to adopt and create virtual encounters that cover a broad spectrum of clinical problems. This interactive application allows students to formulate hypotheses, test interpretation, make diagnoses and plan treatment using patient interviews, exams, modern imaging and diagnostic procedures. The primary goal of this study is to collect data on student perceptions to evaluate whether students find DxR computer-based activities more beneficial and functional than professor moderated case-based teaching.

## METHODS

The overall strategy in this study will be to collect data from a student response survey to analyze the efficacy of DxR Clinician in promoting student engagement when compared to conventional professor led case discussions. This study will be divided into 3 phases: preparation of session materials, administration of intervention, and analysis of student responses. The inclusion criteria for this study will 125 M1 students at OUWB in the year 2017. Data will be examined using Mann-Whitney U-test.

## ANTICIPATED RESULTS

Compared to the case-based discussion, DxR Clinician is expected to promote student engagement and provide educators with a valuable resource to use in their curriculum development. The anticipated results are expected to demonstrate that students are more receptive to an interactive digital tool that allows them to facilitate their didactic learning.

## CONCLUSION

The results are expected to support the hypothesis that the utilization of a virtual patient encounters through DxR Clinician will increase student engagement in the classroom setting. This research study has the potential to positively impact medical education delivery.

# A Comprehensive Evaluation of Antibiotic Prescribing Practices at Discharge

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## INTRODUCTION

The Centers for Disease Control and Prevention (CDC) estimates that more than 2 million illnesses and 23,000 deaths are caused by drug-resistant bacteria in the United States each year. Antibiotic stewardship programs have traditionally focused on antibiotics given during hospitalization. However, the majority of the antibiotic course is completed after hospital discharge. Therefore, there is a need to examine whether antibiotics prescribed at the time of discharge are also appropriate. A comprehensive review of antibiotic prescribing practices at the time of discharge at another institution found that 53% of the cases received an inappropriate antibiotic. The purpose of this study is to examine the appropriateness of antibiotic prescriptions at discharge at Beaumont Health.

## METHODS

The study will be a retrospective cohort study of adult inpatients at Beaumont Hospital-Royal Oak. The study will include patients that received an oral antibiotic prescription at time of discharge from January 15-February 1, 2016. 382 patients, meeting the inclusion and exclusion criteria, will be selected and accessed for appropriate antibiotic use (antibiotic, dosage, and duration), according to guidelines available from the Infectious Diseases Society of America and in conjunction with an attending infectious diseases physician. Information about demographics, co-morbidities, and hospital stay will be recorded for each patient. The percentage of appropriate antibiotic use will be calculated. Logistic regression will be used to identify any additional factors that are associated with appropriate antibiotic use.

## ANTICIPATED RESULTS

Based on previous studies, we anticipate that the percentage of cases that received an inappropriate antibiotic (either due to inappropriate choice, dosage, or duration) will be around 50%. Gender, infectious disease consultation, use of azithromycin, and community-acquired pneumonia might be associated with appropriate antibiotic usage.

## CONCLUSION

The results are expected to provide a baseline for correct antibiotic prescribing practices. It will help to support ongoing antibiotic stewardship programs.



# Utility and Effectiveness of Antiphospholipid Antibody Laboratory Consultation at Beaumont Hospital, Royal Oak

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## INTRODUCTION

For clinicians, laboratory testing for antiphospholipid syndrome can be challenging due to the complexity of testing and interpretation of results. Implementing consultation services could help in facilitating this process, and laboratories may find it useful in knowing what departments to cater to. The objective of this study is to retrospectively explore this question. Furthermore, we review our results and evaluate the effectiveness of our panel in diagnosing APS.

## METHODS

Using EPIC 451 and 496 specimens with APA consults for the years 2014 and 2015, were identified. 300 specimens from 285 patients were randomly selected for review. The ordering physician's subspecialty and indication for the test, in addition to age and gender were recorded. Specimens were classified as positive, indeterminate or negative. For positive and indeterminate tests, the results of lupus anticoagulant (LA), anticardiolipin antibody (ACA) and beta-2 anti-glycoprotein I (B2GI) antibody tests were recorded. The positive specimens were then classified as triple, double or single positives.

## RESULTS

Mean age was 44.7 and male: female ratio was 1:3. 24 specimens were positive (4 triple, 10 double, 10 single), 21 indeterminate and 234 negative. Mean age of patients with positive test results was significantly higher than those with indeterminate and negative results (61.6 vs. 47.9 and 42.8,  $p < .0378$  and  $< .0001$ ). The three most common subspecialties were OB/GYN, Internal Medicine (IM) and Hematology/Oncology. The top three indications were DVT/PE, fetal-loss and autoimmune disease. For positive tests, 67% had LA, 58% had ACA and 50% had B2AGI.

## CONCLUSIONS

Orders for APA consultation increased between 2014- 2015 at our institution, suggesting clinicians were not dissatisfied. Laboratories seeking to market this service might have the most success targeting OB/GYN, IM and Hematology/Oncology practices. Consultation panels should include all categories of testing, as the vast majority of positive specimens are single or double positive.

# Outcomes of Inferior Vena Cava Filters as Assessed by Post-Implantation Computed Tomography

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## INTRODUCTION

The use of inferior vena cava (IVC) filters has become a widespread treatment option for patients with venous thromboembolism (VTE) who have a contraindication to anticoagulation. The Center for Disease Control estimates that up to 900,000 Americans could be affected by VTE with pulmonary embolism annually. While IVC filters are postulated to reduce the risk of pulmonary embolism, the incidence of filter implants has increased substantially over three decades. Despite the increasing use of filters, however, the literature supporting their clinical efficacy and defining their risk remains limited. This study aims to investigate the potential complications in IVC filter recipients in the Beaumont Health System to improve our understanding of IVC filter complication rates and possible CT clues that could alert us to their occurrence.

## METHODS

A retrospective chart review was conducted to identify patients ( $\geq 18$  years) who received an IVC filter implant and had a subsequent abdominal computed tomography (CT) scan at any point after the filter implantation for the past 10 years. All adults were included except pregnant women. The IVC filters were assessed on CT to analyze for filter tilt, strut fractures, thrombus formation, filter migration above the renal vessels, and perforation through the IVC wall.

## ANTICIPATED RESULTS

The expected outcome of this study is furthering the literature regarding long-term IVC filter complications and defining them with CT analysis. We expect to find information that will better classify filter types based on their risk for developing filter complications. This study will help to better identify what complications are common and define a group in which advanced IVC filter management is necessary.

## CONCLUSION

We expect this data to contribute to the understanding of long-term IVC filter implant complications on patient care and act as groundwork for future studies to better differentiate the relationship between the risk and reward of IVC filter implantation.

# Whole Genome Analysis of Putative *Plesiomonas Shigelloides* Ampicillin Resistance Genes

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## INTRODUCTION

*Plesiomonas shigelloides* are water- and foodborne bacterial pathogens, known to cause gastrointestinal infections in humans. Most infections are mild; however, in severe cases of gastroenteritis, antimicrobial intervention is often warranted. Antimicrobial susceptibility tests on *P. shigelloides* strains, including the ATCC strain 14029 (type strain), show widespread resistance to ampicillin. Generally, bacterial resistance to ampicillin can be due to modifications in Penicillin Binding Proteins (PBPs; inhibiting the binding of beta-lactam antibiotics) or by the production of beta-lactamases (inactivating the beta-lactam ring). However, recent data shows that there might be multiple mechanisms of resistance in *P. shigelloides*. This study aims to elucidate the ampicillin resistance mechanism(s) of *P. shigelloides* by identifying target resistance genes through genome sequencing.

## METHODS

Previously, MiSeq NextGen DNA sequencing was run on the ampicillin-resistant *P. shigelloides* type strain following DNA extraction and digestion to yield 655,994 reads. Due to the lack of an annotated reference strain, the use of genomic analysis software (Galaxy, Tablet, and possibly others) is necessary to compile and read the contigs. Concurrently, known ampicillin resistance genes from genetically similar microorganisms such as *E. coli*, *Aeromonas* spp. and *Vibrio cholerae* were compiled; specifically beta-lactamase gene sequences and common PBP gene modifications. These known resistance gene sequences will be systematically compared to the *P. shigelloides* type strain DNA contigs using the publically available software, nucleotide BLAST (Basic Local Alignment Search Tool; NCBI).

## ANTICIPATED RESULTS

Homologous beta-lactamase and PBP modified sequences are expected to show significant regions of overlap with *P. shigelloides* type strain DNA contigs. This information will allow mapping of ampicillin resistance regions to the *P. shigelloides* genome.

## CONCLUSION

Results are expected to help elucidate the antibiotic resistance mechanism(s) for *P. shigelloides* ampicillin resistance. Furthermore, identification of ampicillin resistance gene sequences can be used as targets for medical intervention, ultimately eradicating *P. shigelloides* from infected patients.

# Nitroglycerin-Associated Hypotension in Inferior ST Segment Elevation Myocardial Infarction

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## INTRODUCTION

During Emergency Medical Services (EMS) transport, ST segment elevation myocardial infarction (STEMI) patients often receive nitroglycerin (NTG) regardless of STEMI location. In emergency department (ED) patients with inferior STEMI and suspected right ventricular infarction, NTG is often withheld due to concern for hypotension. Limited evidence suggests that NTG may not be associated with increased risk of hypotension in EMS patients with inferior vs. non-inferior STEMI. We sought to determine if inferior STEMI was associated with increased risk of hypotension after NTG.

## METHODS

We conducted a retrospective review of STEMI patients transported to our ED via EMS from 2003 to 2013. Subjects had initial systolic blood pressure >100 mmHg and received 1 to 3 doses of sublingual NTG by EMS. Our primary outcome was to identify incidence of hypotension, defined as mean arterial pressure (MAP) <60 mmHg, after NTG. Secondary outcomes included an analysis of variance to assess mean difference in MAP change after NTG in inferior vs. non-inferior STEMI.

## RESULTS

60 inferior STEMI and 81 non-inferior STEMI patients were included. Age, sex and history of coronary artery disease, hypertension, diabetes and dyslipidemia were identified to assure groups were reasonably matched. 4 patients had MAP <60 mmHg after NTG, with 3 having inferior STEMI and 1 having non-inferior STEMI. Mean difference in MAP after NTG was  $-8.5 \pm \text{SD } 18$  mmHg (95%CI -12.6 to -4.5) in the inferior STEMI group and  $-8.5 \pm \text{SD } 14$  mmHg (95%CI -12.0 to -5.0) in the non-inferior STEMI group. A p value of 0.98 showed no significant difference between groups.

## CONCLUSION

MAP <60 mmHg after NTG was uncommon in both groups. All patients had a significantly similar mean decrease in MAP regardless of STEMI location. Although inferior STEMI patients may not be at considerably greater risk of hypotension after NTG, a prospective study is warranted to guide treatment.

# The Effect of Impact Exercise on Bone's Role as an Acute Sodium Buffer

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## INTRODUCTION

Recent advances in bone exercise physiology research have demonstrated bone may play a role as a sodium buffer. Based on Wolff's law of bone remodeling, the complex interplay between serum sodium concentration and bone's sodium reservoir may also be affected by different forms of exercise. This study aims to more closely identify how impact exercise and sodium may affect bone's role as a sodium buffer.

## METHODS

This study is a single-blind, randomized control trial. There are eight participants. The study consists of two exercises (run and swim) and two conditions (salt and placebo). All participants will complete a one-hour exercise trial in each of the four exercise condition combinations. Bone mineral content (BMC), and bone mineral density (BMD) will be measured pre- and post-exercise by dual-energy x-ray absorptiometry (DEXA) scan. Blood and urine electrolyte levels, as well as blood pressure, will also be collected before and after each trial. A 2 x 2 repeated measures analysis of variance (ANOVA) will be used to examine differences between exercises and conditions for all variables collected. Paired t-tests will be used to assess pre- to post-exercise variables.

## ANTICIPATED RESULTS

During both exercises, the salt intervention groups are expected to experience less change in BMD and BMC than the placebo group. Furthermore, the non-impact exercise trial group is expected to experience less change in BMD and BMC content than the impact exercise group during both placebo and salt intervention conditions.

## CONCLUSION

Sodium shifting from bone to other compartments in the body may lead to a decrease in bone mineral content and density. A reduced bone mineral content and density can be a risk factor to bone health, leading to complications such as fracture. Elucidating the differences between impact vs. non-impact exercise may enhance our understanding of the contributions of sodium intake on osteopenia.

# Perception of Body Donation Among African Americans

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## INTRODUCTION

The use of cadavers for anatomical studies has long been an important component of medical education. To supply the needed cadavers, most medical schools rely on donations from people who chose to donate their bodies upon death. While there are very few studies examining the demographics of body donors, the majority of people who choose to donate their body tend to be Caucasian males, leading to a lack of racial diversity among cadavers in the anatomy lab. This study tries to understand why minorities, more specifically African Americans, do not participate in these body donation programs.

## METHODS

In this study we will closely examine attitudes, knowledge and cultural beliefs that may influence willingness of African Americans to participate in body donation programs.

We will conduct 10 different focus group sessions at local Optimist Clubs before or after the general meetings. Optimist clubs in Metro-Detroit are good representatives of the population the study is geared towards. Each focus group will consist of 5-7 people. At the focus group sessions, key personnel will give an overview of the topic we are going to be discussing. The inclusion and exclusion criteria will be read out loud during this time. Following data collection, audio recordings will be transcribed and the data will be analyzed in order to identify common themes that emerge in responses.

## ANTICIPATED RESULTS

We hypothesize that the low participation rates of African Americans in body donation programs are due to unidentified cultural beliefs surrounding body donation.

## CONCLUSION

The results are expected to help us understand African American beliefs surrounding body donation. Recognizing the influencing factors and barriers may help us find ways to increase participation amongst this group.

# Readmission Rates of Reverse and Anatomical Total Shoulder Arthroplasty

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## INTRODUCTION

The rate of total shoulder arthroplasty (TSA) is rising, and currently over 50,000 procedures are done within the United States annually. As a driver to improve patient morbidity and reduce overall cost, the Affordable Care Act has placed increased emphasis on decreasing readmission rates. The goal of this project is to measure the 30-day all cause readmission rates of reverse and anatomical TSA.

## METHODS

A retrospective cohort study was performed using patients presenting to the orthopedics department of a large Midwestern hospital. Patients who underwent primary reverse and anatomical TSA between 2012-2016 were identified and included in the study. These groups were then individually analyzed for 30-day all cause readmission rates, and specific trends for demographic information, medical comorbidities, and surgical factors. A multiple logistic regression statistical analysis will be performed in order to determine how risk factors impact the probability of TSA readmission.

## ANTICIPATED RESULTS

Overall, 1684 patients were included within the cohort. So far the readmission rates for the Reverse and Anatomical TSA cohorts measure favorably with the national average, which is expected will continue through the end of data analysis. Anticipate finding include specific characteristics attributed to each cohort that may contribute to positive and negative outcome. Future data will be grouped into three broad categories including, patient factors, medical comorbidities, and surgical factors. It is anticipated that tobacco use, low socioeconomic status, obesity, and longer procedure times will be correlated with a 30-day all cause readmission.

## CONCLUSION

It is likely that 30-day all cause readmission rates from 2012-2016 were lower than previously reported national averages. Future results will identify specific risk factors for reverse and anatomical TSA that will aid in improved treatment and patient safety.

# Sleep, Emotional Regulation, and Burnout in Medical Students and Residents

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## INTRODUCTION

In the United States today, up to 45.8% of physicians report experiencing at least one symptom of burnout. Studies have shown that increased rates of burnout are correlated with sleep disturbance, or a lack of quality sleep. The primary goal of this study is to explore the role of emotional regulation as an intermediate variable in the relationship between sleep and burnout. Thus, this study proposes that sleep disturbance negatively affects one's ability to emotionally regulate, and the subsequent emotional dysregulation contributes to burnout.

## METHODS

This study will employ a cross-sectional study design, surveying OUWB medical students. The survey will contain questions from 5 evidence-based surveys: The Pittsburgh Sleep Index, the Sleep Quality Indicator, the Emotional Regulation Questionnaire, the Difficulties in Emotional Regulation Questionnaire, and the Maslach Burnout Inventory. Based on the results of this study, measures of correlation ( $r$  values) will be ascertained between sleep, emotional regulation, and burnout.

## ANTICIPATED RESULTS

We anticipate that the correlation between a lack of sleep and emotional dysregulation, and the correlation between emotional dysregulation and burnout, will be stronger than the correlation between a lack of sleep and burnout.

## CONCLUSION

The results are expected to support the hypothesis that emotional regulation is an intermediate variable between sleep and burnout. This research suggests that sleep is an important part of daily emotional life and may help physicians and healthcare providers experience a more fulfilling practice. In addition, we are able to surmise that teaching healthcare professionals emotional regulation skills can help to buffer against the high burnout rates in the medical world today.



# A Comparative Analysis of Clinical Profiles: Subsequent Botulinum Toxin A Injection after Sacral Neuromodulation

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## INTRODUCTION

Despite initial response to sacral neuromodulation, some patients seek additional treatment for recurrent or residual overactive bladder (OAB) symptoms. The purpose of this study was to identify patient characteristics or pre-treatment urodynamic factors associated with patients undergoing intradetrusor onabotulinumtoxin-A (BTX) injections after chronic neuromodulation.

## METHODS

We retrospectively reviewed 281 patients in a prospective neuromodulation database who underwent BTX injections after successful neuromodulation, and compared them to those that did not receive BTX. Baseline characteristics, prior treatments, urodynamic data, Interstitial Cystitis Symptom/Problem Indices (ICSIPI) and Overactive Bladder Questionnaire (OABq) scores were compared between groups. Descriptive statistics were performed.

## RESULTS

Of 281 patients, 20 received a total of 37 BTX injections and were compared to 261 that did not receive BTX. Demographics, primary indication for neuromodulation, and treatments prior to neuromodulation did not differ between groups except that a higher proportion in the BTX group had a history of urethral sling (7/16; 43.8% vs. 31/227; 13.7%;  $p=0.005$ ). Lead location differed significantly between groups ( $p=0.0002$ ) with the BTX group having a higher proportion of pudendal lead placement. A higher proportion in the BTX group had detrusor overactivity (DO) (8/9; 88.9% vs. 56/116; 48.3%;  $p=0.033$ ) and DO with leak (7/9; 78% vs. 40/110; 36.4%;  $p=0.028$ ) on baseline urodynamics. Presence of sensory urge was higher but not statistically significant (4/8=50% vs. 26/93=28.0%,  $p=0.23$ ). Baseline ICSIPI, OABq scores, reoperation, and explant rates did not differ between groups. Of the 7 patients in the BTX group who had InterStim reoperation, 3 had BTX before the reoperation, 3 had BTX after the reoperation, and in 1 the relationship between reoperation and BTX was unknown.

## CONCLUSION

While symptom severity and demographics were not associated with the need for BTX injections after neuromodulation, severe incontinence associated with DO may portend the need for additional treatment even with successful neuromodulation.

# Outcome Assessment of OUWB Diagnostic Medicine Clerkship

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## INTRODUCTION

In 2012, the American Board of Internal Medicine Foundation launched Choosing Wisely, a campaign to reduce the utilization of unnecessary medical tests and procedures. The Association of American Medical Colleges has also determined the utilization and interpretation of diagnostic tests to be a core entrustable professional activity (EPA) for entering residency. The Diagnostic Medicine clerkship (DM) at Oakland University William Beaumont School of Medicine (OUWB), which integrates diagnostic imaging and pathology, aims to address this EPA and is the first of its kind in medical education. The objective of this study is to assess the effectiveness of DM in helping OUWB graduates order and interpret imaging and laboratory studies wisely during residency.

## METHODS

200 first- and second-year Beaumont Health System residents will be invited to participate in the study. Residents will be divided into two groups, OUWB graduates who have had DM and non-OUWB graduates who have not had a DM-like rotation. Participants will complete a survey regarding their diagnostic medicine abilities and a quiz that assesses competency in test utilization and interpretation. Thematic analysis of the data will be performed, followed by paired statistical tests.

## ANTICIPATED RESULTS

Residents who have had a rotation in diagnostic medicine, pathology, and/or radiology are expected to feel more confident in their diagnostic medicine abilities. Additionally, OUWB graduates, upon entering residency and facing daily challenges in medical test utilization and interpretation, are expected to better appreciate the benefits of a diagnostic medicine clerkship.

## CONCLUSION

The results are expected to support the hypothesis that DM helps OUWB graduates choose and interpret diagnostic and screening tests wisely. The results from this study will also allow for further improvement and development of the clerkship and will provide further insight into the impact of implementing a diagnostic medicine-focused clerkship in the medical school curriculum.

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