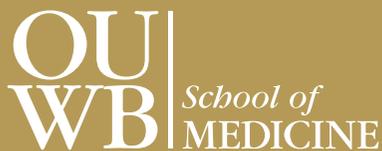


Class of 2017  
**EMBARK CAPSTONE  
COLLOQUIUM**

THURSDAY, MARCH 16, 2017



OAKLAND UNIVERSITY WILLIAM BEAUMONT



Dear OUWB students, faculty and staff,

It is my pleasure to welcome you to the Embark Capstone Colloquium where we recognize the graduating members from the Class of 2017 for successfully completing their capstone research projects.

We are grateful to you for attending and speaking personally with our students about their research as they present posters describing their work. This booklet affords you an additional opportunity to read their abstracts highlighting the wide range of research interests.

Our students have spent the last four years in medical school fulfilling the Embark Program mission to foster an appreciation for lifelong, self-directed learning and to gain a clear understanding of how to implement and complete a research project. The goal of this program is to offer each student the potential to achieve scientific or social impact through his or her findings.

Embark Program mentors guide our medical students throughout this journey, and we thank them for their commitment to our students' success in their research. The time taken from their responsibilities as basic science or clinical faculty to work with our students is recognized as a vital contribution to the future of OUWB and its graduates.

As our students complete this endeavor, we congratulate them on a job very well done, and we hope this experience has provided the knowledge and inspiration to continue exploring avenues for research as they embark on their careers as physicians.

Sincerely,



**Robert Folberg, M.D.**

Founding Dean, Oakland University William Beaumont School of Medicine  
Chief Academic Officer, William Beaumont Hospital

## MISSION

The OUWB Embark Program looks to foster an appreciation for lifelong learning, and to graduate physicians with a clear understanding of how to implement outcomes-based research that has the potential to achieve scientific or social impact.

# PROGRAM

## WELCOME

**Robert Folberg, M.D.**

Founding Dean, Oakland University William Beaumont School of Medicine  
Chief Academic Officer, William Beaumont Hospital

## EMBARK CAPSTONE POSTER PRESENTATION - SESSION I

Clinical Research (Posters 1 – 39)

## EMBARK CAPSTONE PROJECT PRESENTATIONS

**Michael Rezaee**

*Prevalence and Associated Cost and Utilization of Multiple Chronic Conditions  
in the Outpatient Setting among Enrollees of an Employer-based Health Plan*

Mentor: Martha Pollock, M.D.

Department of Internal Medicine, Beaumont Health

**Aishwarya Navalpakam**

*Behavioral Perceptions of Oakland University Female College Students  
Towards Human Papillomavirus Vaccination*

Mentor: Inaya Hajj Hussein, Ph.D.

Department of Biomedical Sciences,  
Oakland University William Beaumont School of Medicine

## EMBARK CAPSTONE POSTER PRESENTATION - SESSION II

Laboratory Research (Posters 40 – 41)

Global and Community Health Research (Posters 42 – 62)

Health Systems Research (Posters 63 – 68)

Medical Education Research (Posters 69 – 78)

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**Robert Folberg, M.D.**

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2	Stephen Carveth	Retrospective Post-Concussion Assessment: New Perspective on the Role of Emotional Components and Concussion Recovery in Pediatric Patients
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21	Brian Malley	Association of Hospital Characteristics with Outcomes of Patients Resuscitated After Out of Hospital Cardiac Arrest

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# Is Obesity Consultation a Role for all Physician Providers?

Sneha Butala<sup>1</sup>, Victoria Lucia, Ph.D.<sup>2</sup>, Nafisa Kuwajerwala, M.D., FACS<sup>3</sup>

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<sup>3</sup>Department of Surgery, Breast Division, St. John Providence

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## INTRODUCTION

Being overweight or obese is an established risk factor for the development of breast cancer in postmenopausal women, especially those who have not been previously exposed to hormone replacement therapy. This study assesses the prevalence of lifestyle modification counseling by primary care and specialist physicians among breast symptom patients and patients with a history of breast cancer.

## METHODS

An anonymous survey about patient-physician interactions, patient knowledge about the relationship between obesity and comorbidities including cancer recurrence, and patient level of motivation to pursue lifestyle modifications and weight loss was distributed to all patients >25 years old presenting with breast symptoms. Additional patient information, such as BMI, was obtained from the medical record.

## RESULTS

171 patients responded to the survey. A majority of patients were aware that being overweight or obese is linked to an increased risk of postmenopausal breast cancer. However, nearly one-third of patients with a current diagnosis or previous history of breast cancer were not aware that being overweight or obese is linked to an increased risk of recurrence and lower overall survival. Approximately 75% of patients surveyed were moderately or highly motivated to adopt lifestyle modifications. No significant association was found between types of physicians speaking to the patient versus the patient's level of motivation. Of those patients who reported being counseled by physicians, there was a significant association ( $p=0.03$ ) found between success with weight loss and type of physician discussing the importance of maintenance of health.

## CONCLUSION

This study reiterates the importance for all physicians, regardless of specialty, to educate their patients periodically on lifestyle modifications and weight loss. Obesity is a major public health problem being increasingly linked to various diseases in almost every specialized field of medicine. Addressing this issue is not the responsibility of only the primary care physician.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# **Retrospective Post-Concussion Assessment: New Perspective on the Role of Emotional Components and Concussion Recovery in Pediatric Patients**

**Stephen L. Carveth<sup>1</sup>, Neal M. Alpiner, M.D.<sup>2</sup>**

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## **INTRODUCTION**

With approximately 1.6-3.8 million concussions occurring each year in the U.S. and the prospect of future health consequences, concussions have become a topic of much interest in the research community. Most concussion research focuses on prevention and management; however, little research has focused on the pediatric population and how concussion management and psychological factors interplay. The primary goal of this study is to determine if objective neurocognitive computer scores and subjective psychological and symptom scores impact each other during the concussion recovery period.

## **METHODS**

409 patient studies were analyzed from data during the timeframe of 01/01/2013-09/14/2016. After application of our inclusion criteria, 88 patient studies were assessed. The data included objective scores as assessed by a neurocognitive computer program called CNS Vital Signs. These objective scores included composite memory, verbal memory, visual memory, complex attention, cognitive flexibility, processing speed, executive function and simple visual attention. Concurrently, subjective patient scores were gathered for the Head Injury Questionnaire (HIQ), Zung Depression score (ZUNG), and Screen for Child Anxiety Related Disorders (SCARED). Using a univariable Analysis of Variance (ANOVA) of continuous variables, these scores were analyzed for significance.

## **RESULTS**

More subjects expressed a propensity to convey symptoms of an anxiety related disorder during their post-concussion period rather than depression or head injury symptoms, 20.5 % vs 3.4% vs 3.4%, respectively. Secondly, the composite memory, visual memory, cognitive flexibility, processing speed and executive function scores were linked to higher susceptibility of anxiety related symptoms than other symptoms (all p-values <0.05).

## **CONCLUSION**

The results support the hypothesis that objective neurocognitive scores can be used to assess psychological components during concussion recovery. These findings may help clinicians monitor their patients more closely and identify patients with predisposing emotional components that can impact concussion recovery.

# Management of Intussusception after Successful Enema Reduction

Renee Cholyway<sup>1</sup>, Begum Akay, M.D.<sup>2</sup>

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## INTRODUCTION

Intussusception is the most common bowel obstruction in children. It is often treated with enema reduction even though there is a chance of recurrence. Historically, patients are managed with inpatient observation, although the exact timeframe is undefined. We aim to stratify risk factors for recurrence after enema reduction to help determine if monitoring is necessary and for how long.

## METHODS

Quantitative data were collected from charts of patients diagnosed with intussusception between 3 months and 5 years of age and treated for intussusception using air or barium enema reduction between January 2004-2013. Data were compared and risk factors identified for recurrence after a successful reduction by using exact log regression due to population size. Finally, a treatment plan is proposed in order to minimize observation periods without delaying the diagnosis and treatment of recurrences.

## RESULTS

Of 103 identified patients, successful reduction occurred in 56% of patients, partial reduction to a more proximal location in 25%, no success in 19%, and recurrence in 14% of patients. As age increases from <12 to 12-36 to >36 months, the percent of patients having successful reduction increases from 35% to 52% to 64%, respectively, and the odds of not requiring more interventions or experiencing recurrence increases by 86.6% ( $p=0.049$ ). With each additional attempt at enema reduction, the odds of recurrence decreases by 88.2%. The mean number of attempts in patients without recurrence were  $3.2 \pm 2.8$ , and in patients with recurrence  $1.2 \pm 0.45$  attempts (OR 0.68,  $p=0.0086$ ).

## CONCLUSION

Overall, the risk of recurrence is low. Periods of observation should be dictated by the patient's clinical condition and not the chance of recurrence. Patients who had multiple enema reductions with success or are older do not require admission to monitor for recurrence, but may require admission for fluid resuscitation. By understanding these conditions, we can reduce the length of stay, reduce costs to patients and the hospital, and maximize patient care.

# **Epidemiology and Quality of Life of the Underactive Bladder in the U.S.: A Cross-Sectional Survey**

**Florence Doo, M.A.<sup>1</sup>, Kassem Faraj<sup>1</sup>, Andrew Vereecke, C.P.A., M.B.A.<sup>2</sup>,  
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## **INTRODUCTION**

While overactive bladder is a well-known urological condition, underactive bladder (UAB) appears to be more uncommon, with no known effective medications or therapies for long-term treatment. Since the etiology and exact prevalence are unknown in the U.S. context, it is difficult to diagnose patients and develop treatments. This study aims to assess the prevalence, awareness, and quality of life (QOL) impact of symptoms suggestive of underactive bladder (UAB) in the USA.

## **METHODS**

A thirteen-item paper survey was mailed to 25,000 individuals 60 years or older living in the USA. It aimed to collect information relating to demographics, familiarity with UAB, patient urinary symptoms, and QOL concerns.

## **RESULTS**

977 survey participants were stratified into four groups based on the number of UAB symptoms present (straining, retention, and difficulty emptying). As the number of reported UAB symptoms increased, increased prevalence of other unique urinary symptoms were observed ( $p < 0.0001$ ). Increased UAB symptoms were associated with an increased prevalence of concerns related to urinary symptoms and overall urinary status ( $p < 0.0001$ ). Urology visits were most common in individuals who reported the most UAB symptoms ( $p < 0.0001$ ); however, there was no difference among groups with regard to UAB awareness. Women were less likely to report any UAB symptoms ( $p < 0.0001$ ), symptoms of urgency ( $p = 0.001$ ), retention ( $p = 0.002$ ), difficulty emptying their bladder ( $p < 0.0001$ ), and were more likely to have a history of catheter use for retention ( $P = 0.002$ ) and urology visits in the past 3 years ( $p < 0.0001$ ).

## **CONCLUSION**

Underactive bladder symptoms are common and can have a significant impact on a patient's QOL, although awareness is still lacking among potentially affected individuals. More research must be done to better differentiate between UAB and conditions that are clinically similar.

# **Radiologic Versus Pathologic Nodal Staging of the Untreated Head and Neck Malignancy**

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*<sup>3</sup>Department of Radiation Oncology, Beaumont Health System*

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## **INTRODUCTION**

In cancers of the head and neck, the most important prognostic factor is the status of the cancer spread to cervical lymph nodes. Therefore, physicians must carefully assess the status of cervical lymph nodes in their patients during an initial diagnostic work-up. This study investigated the accuracy of commonly used imaging tests, computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography (PET), in predicting lymph node status for patients treated at Beaumont Royal Oak.

## **METHODS**

A list of 476 patients with a histologic diagnosis of head and neck cancer between 2005-2012 was created using the Beaumont Cancer Treatment and Outcomes Registry. Included patients were over 18 years of age who received neck dissection surgery prior to any other surgery, radiation, or chemotherapy with available imaging and pathology reports documented in the electronic health record. This yielded a list of 62 eligible study subjects, who were treated between 2007 and 2012. Data collected included patient's age at diagnosis, site of the primary tumor, nodal status predicted by corresponding CT, MRI, or PET, and histopathological diagnosis following surgery.

## **RESULTS**

The age at diagnosis for the 62 subjects treated between 2007 and 2013 ranged from 34-93 with an average of 64 years. Most of the tumors originated from the oral cavity (39/62), followed by the oropharynx (10/62) and salivary glands (10/62). 76% of our patients received CT, 30% received MRI, and 71% received PET scan. We found sensitivities of 61.5%, 100%, and 58.3% for CT, MRI, and PET scans, respectively. Specificity values were 94.3%, 80%, and 36.4% for CT, MRI, and PET scans, respectively.

## **CONCLUSION**

Sensitivity and specificity of CT, MRI, and PET scans at predicting nodal status at Beaumont Royal Oak fall within reported ranges of corresponding meta-analyses. PET scans have poor predictive value and should have a limited role in staging lymph nodes at initial diagnosis.

# Laryngeal Cuff Force Application Modeling During Aeromedical Evacuation Simulation

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## INTRODUCTION

Endotracheal tubes assist in mechanical ventilation and protect the airway in sedated patients. The blood vessels of the tracheal mucosa are compressed by high tracheal tube cuff pressures (>30cmH<sub>2</sub>O), leading to reduced mucosal bloodflow with resulting ischemia. This may result in complications such as recurrent laryngeal nerve palsy, mucosal ulceration, tracheal stenosis or tracheal rupture. Previous research shows a direct correlation between aircraft pressure altitude and the pressure reading from the tracheal cuff, with resulting pressures >80cmH<sub>2</sub>O at 10,000ft. Standard practice is to periodically remove air from the cuff during ascent based on assumed increased pressure on the adjacent tracheal mucosa.

## METHODS

We sought to integrate balloon physics and thermodynamic analysis into our experimental model to determine whether a tracheal cuff exerts increased force on the mucosal lining due to reduced atmospheric pressure, regardless of changes in cuff volume. A vacuum chamber capable of producing negative pressures replicating altitudes up to 40,000ft was constructed. Using a direct reading micro pressure sensor in a 22mm diameter semi-rigid tube, we made multiple test runs on different tubes to assess the direct force applied by the tracheal cuff against the laryngeal tube analog.

## RESULTS

Standard tracheal cuffs demonstrated direct force/pressure relationships when properly inflated to 20cmH<sub>2</sub>O, but much less than reported in the literature. There is a significant difference between the data collected in our precision engineering stand and current literature. Current literature reports values of 55-150cmH<sub>2</sub>O at 5000ft. In our experiments, we report values of 23-25cmH<sub>2</sub>O at 5000ft.

## CONCLUSION

We were not able to reproduce the increased cuff pressures at altitudes previously reported. Our data indicates that a properly inflated cuff does not exceed the critical pressure of 30cmH<sub>2</sub>O until the altitude exceeds 8,000ft. Our approach suggests that the standard practice of deflating the laryngeal cuff on ascent should be reevaluated as it may be counterproductive to patient safety.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# **An Electronic Medical Record Driven Order Set to Guide Appropriate Antibiotic Selection for Outpatients with Acute Respiratory Infections**

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## **INTRODUCTION**

Antimicrobial stewardship programs were developed to promote more appropriate use of antibiotics and minimize adverse effects associated with antibiotic use. These methods have been effectively implemented in inpatient settings. However, application of these programs in outpatient settings has been challenging. Thus, novel methods of limiting antibiotic use and improving adherence to guidelines are needed for outpatient settings.

## **METHODS**

The objective was to limit antibiotic use and improve adherence to antimicrobial guidelines for acute bronchitis, acute otitis media, acute pharyngitis, acute sinusitis, acute upper respiratory tract infections, and community-acquired pneumonia in an outpatient setting. This prospective preintervention/postintervention study was conducted at the Beaumont Health System Adult Outpatient Clinic. The intervention included a monthly 30-minute educational program and an electronic order set that was implemented from January 1, 2016 to June 30, 2016. Following the intervention, data were collected on antibiotic use and compared to data from the same six month period of the preceding calendar year.

## **RESULTS**

633 patients diagnosed with acute bronchitis, acute otitis media, acute pharyngitis, acute sinusitis, acute upper respiratory tract infections, and community-acquired pneumonia were treated from January 1 to June 30, 2015 while 209 patients who were treated using the EMR order sets were identified from January 1 to June 30, 2016. Following the intervention, the overall use of antibiotics for treating acute upper respiratory infections decreased significantly from 47.1% in 2015 to 35.9% in 2016 ( $p = 0.005$ ), antibiotics were prescribed less often for acute bronchitis ( $p < 0.001$ ) and acute upper respiratory tract infections ( $p < 0.001$ ), and adherence to antimicrobial guidelines for acute otitis media, acute pharyngitis, and acute sinusitis improved. However, the intervention did not change the overall use of antibiotics for acute pharyngitis ( $p = 0.294$ ), acute sinusitis ( $p = 0.114$ ), or community-acquired pneumonia ( $p = 0.072$ ).

## **CONCLUSION**

This study demonstrates some success in implementing an EMR driven order set and education intervention aimed at decreasing antimicrobial use and improving adherence to accepted treatment guidelines for acute upper respiratory infections.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Care in Public Recreational Facility Cardiac Arrest Locations in Michigan

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## INTRODUCTION

Strategies to improve out-of-hospital cardiac arrest (OHCA) outcome with public access defibrillator (PAD) deployment should include placement of automated external defibrillators (AED) in locations where arrests are likely to occur and where the device is likely to be used. AED placement is mandated by statute in Michigan but their need and use in other recreational facilities is unknown. The primary goal of this study is to describe the incidence and treatment of recreational cardiac arrests in Michigan and assess AED placement and use.

## METHODS

We performed a retrospective study of recreation out-of-hospital cardiac arrests in Michigan from 7/1/10-6/30/13. Cases were identified using a key word search of public cardiac arrests from the Michigan Emergency Medical Services Information System (MIEMSIS) database. Cases were categorized by locations according to National Emergency Medical Services Information system location criteria. EMS Utstein data was collected from MIEMSIS. To account for seasonal variations in Michigan we calculated annualized rates of events. Our primary outcome was rate of events and AED use.

## RESULTS

During the study period there were 167 cardiac arrests. They were predominately older (mean 61, range 19-100, male (82.0%) and had a high rate of return of spontaneous circulation (ROSC) (44.1%). Arrests were most commonly at parks, athletic clubs, golf courses and campgrounds. Rates of events and AED places are listed in table.

## CONCLUSION

Public AED use in health clubs is much more frequent than in other recreational locations. This is perhaps due to Michigan legislation mandating AEDs in health clubs. Cardiac arrests in outdoor recreational locations are rarely treated with public AED, despite a seasonal incidence that is higher than that of indoor athletic facilities.

## **Lumbar Puncture Position: Prone vs Lateral**

**Zachary Hartley, M.B.A.<sup>1</sup>, Jeffrey Wilseck, D.O., FAOCR<sup>2</sup>, Monzer Chehab, M.D.<sup>2</sup>**

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### **INTRODUCTION**

Lumbar punctures are fairly common procedures that happen daily within the hospital. Traditionally patients are in the left lateral decubitus or the prone position for a lumbar puncture. Technically, prone position lumbar punctures are easier to perform for interventional radiologists than lateral decubitus ones. This raises the question if patient position has a measurable effect on cerebrospinal fluid opening pressure. To date, there have been no direct comparisons between the two positions.

### **METHODS**

Patients began in either the lateral decubitus or prone position and a cerebrospinal fluid opening pressure was obtained. Patients then moved into the other position, and the measurement was retaken. These two values were compared and analyzed. Patients that were already scheduled for a lumbar puncture were approached about enrolling in the study and after consenting were enrolled and underwent the procedure. A paired t-test was used when comparing the measurements.

### **RESULTS**

The means for the two groups were 14.08cm H<sub>2</sub>O and 17.03cm H<sub>2</sub>O for the lateral decubitus and prone positions respectively. When the cerebrospinal fluid opening pressures were compared using a paired t-test, there was no statistical difference between the groups ( $p=0.11$ ).

### **CONCLUSION**

The results support the hypothesis that when measured consistently, patient position does not affect the measurement of cerebrospinal fluid opening pressure. The procedure should therefore be performed in whatever way is safest for the patient, and the operator.

# **Rates of Ophthalmic Misdiagnosis by Emergency Medicine Providers**

**Natalie Huang<sup>1</sup>, Parisa Taravati, M.D.<sup>2</sup>, Jason Wasserman, Ph.D.<sup>3</sup>**

*<sup>1</sup>M.D. Candidate, Oakland University William Beaumont School of Medicine*

*<sup>2</sup>Department of Ophthalmology, University of Washington School of Medicine*

*<sup>3</sup>Department of Biomedical Sciences, Oakland University William Beaumont School of Medicine*

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## **INTRODUCTION**

Many patients presenting in the emergency department (ED) with eye conditions are referred to ophthalmologists following their ED visits. Previous studies have shown that the most frequently observed ophthalmic conditions in the ED are red eye, corneal abrasions, dry eye and swollen eyelids. This study evaluates the frequency of misdiagnosed eye conditions by ED providers, using the referred eye specialists' assessments as a reference.

## **METHODS**

A retrospective chart review was performed on ophthalmic patients following their emergency department (ED) visits between October 1, 2009 and September 30, 2012 at the University of Washington Medical Center (UWMC) and its affiliated hospital Harborview Medical Center (HMC) with an eye-related chief complaint. Using keywords, "ER", "ED", and "Emergency", a search of those patients' electronic medical records returned raw data used for the analysis. The final data included patients aged between 18 and 99 who were seen at the eye clinic within 24 hours of their ED discharge. The evaluations and assessments made by ED providers and ophthalmologists were recorded and compared to determine incidences of misdiagnosis.

## **RESULTS**

The misdiagnosis rates of the seven most common diagnoses (N>10) were analyzed. The results show that dry eye is the most frequently misdiagnosed eye condition (72%), followed by corneal ulceration or keratitis (58%), and hyphemia (42%).

## **CONCLUSION**

The results of this study imply that additional diagnostic training on eye conditions may be needed during Emergency Medicine residency programs.

# Do Primary Hormonal Therapy Outcomes Predict Subsequent Response to Abiraterone or Enzalutamide in Metastatic Castration-resistant Prostate Cancer?

Jonathan Hung<sup>1</sup>, Andrew R. Taylor, M.A.<sup>2</sup>, George W. Divine, Ph.D.<sup>2</sup>,  
Jason M. Hafron, M.D.<sup>3</sup>, Clara Hwang, M.D.<sup>4</sup>

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<sup>3</sup>Department of Urology, Beaumont Health

<sup>4</sup>Hematology/Oncology, Henry Ford Health System

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## INTRODUCTION

Abiraterone and enzalutamide are two novel androgen-receptor (AR)-targeting therapies that improve survival in men with metastatic castration-resistant prostate cancer (mCRPC). Factors that predict abiraterone and enzalutamide response are lacking. The objective of this study was to determine if prostate-specific antigen (PSA) outcomes on primary androgen deprivation therapy (ADT) could predict outcomes on subsequent novel AR-targeting therapies.

## METHODS

A multicenter retrospective review was performed to identify mCRPC patients who had received abiraterone or enzalutamide. Eligible patients must have received novel AR-targeting therapy for at least 8 weeks. The clinical outcome measures evaluated included prostate-specific antigen (PSA) decline, biochemical progression-free survival (bPFS), and overall survival (OS) after initiating novel hormone therapy. Cox regression models were used to analyze the effects of primary therapy response on novel hormone therapy outcomes. Survival probabilities were plotted using the Kaplan-Meier method.

## RESULTS

The population consisted of 80 males who received abiraterone (N=51) or enzalutamide (N=29). The median bPFS on primary ADT was 1.9 years with a median PSA decline of 99%. bPFS on primary ADT showed a significant univariate effect on bPFS and OS after initiating novel ADT ( $p=0.032$  and  $p=0.028$ , respectively). Patients who progressed on primary ADT prior to 1 year had a median bPFS on novel AR-targeting therapy of 3.4 months, compared to a median bPFS of 7.6 months and 8.1 months for patients whose time to PSA progression on primary ADT was  $\geq 1$  and  $< 5$  years ( $p=0.008$ ), and  $\geq 5$  years ( $p=0.026$ ), respectively.

## CONCLUSION

In patients with mCRPC treated with novel ADT, time to PSA progression on primary ADT had a significant effect on time to progression on novel ADT in the univariate analysis. Patients who progressed on primary ADT within the first year of treatment had shorter bPFS on subsequent AR-targeting therapy. These potential predictive factors could help guide clinical decisions when treating mCRPC patients.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Use of an Epigenetic Assay to Reduce Unnecessary Repeat Prostate Biopsies

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## INTRODUCTION

Managing men at risk for prostate cancer (PCa) after an initial negative index biopsy remains a challenge, as prostate biopsies have a false negative value of 20%. Prostate biopsies are costly, invasive, and may lead to urological complications. An epigenetic assay assessing PCa-associated DNA methylation in histologically negative biopsies has been shown to improve the negative predictive value (NPV) relative to standard of care (SOC) yielding a NPV of 90% for all PCa. The goal of this study was to investigate if use of an epigenetic assay would reduce the rate of repeat biopsies, post-biopsy office visits, and post-biopsy PSA tests in men with a negative index biopsy.

## METHODS

A cohort of 150 men (all patients of the Michigan Institute of Urology) with previous negative prostate biopsy was enrolled. The case group consisted of 50 patients with epigenetic assay-positive results and 50 with assay-negative results; the control group consisted of 50 patients managed under SOC. All eligible men had at least one initial histologically negative transrectal ultrasound-guided biopsy. Rate of repeat biopsy and other measures of management were ascertained for each group through retrospective chart review.

## RESULTS

The negative epigenetic assay group had a 41% decrease and the positive epigenetic assay group had a 42% decrease in the incidence rate of number of biopsies as compared to the control undergoing SOC. Patients with the epigenetic assay performed had on average 2.6 biopsies while the control group patients had on average 4.6. biopsies. In addition, patients with the epigenetic assay had a 64% decrease in the incidence rate of biopsy office visits as compared to the control group, and an 80% decrease in the incidence rate of post-biopsy PSA tests. There is no statistically significant difference in the number of biopsies ( $p$ -value = 0.8142), post-biopsy office visits ( $p$ -value = 0.9192), or post-biopsy PSA tests ( $p$ -value = 0.6370) between the positive and negative epigenetic assay groups.

## CONCLUSION

The results indicate that the use of an epigenetic assay in the detection of prostate cancer reduces the rate of repeat biopsies, post-biopsy office visits, and PSA tests. The use of an epigenetic assay in the management of prostate cancer changes physician behavior, and may reduce the costs and complications associated with repeat prostate biopsies, office visits, and PSA tests.

# Using Diffusion Magnetic Resonance Imaging to Assess the Response of Brain Metastases to Stereotactic Radiosurgery

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## INTRODUCTION

A current challenge in the management of patients with brain tumors is assessing treatment response. Diffusion-weighted Imaging (DWI), an MRI technique that measures changes in water movement, has been demonstrated in numerous studies as a potential imaging biomarker of early treatment response. The purpose of this study was to investigate if DWI can be exploited as a treatment response marker in patients with brain metastases treated with Gamma Knife stereotactic radiosurgery (GK).

## METHODS

We reviewed the intracranial radiosurgery outcomes research database and included patients with unresected brain metastases treated with definitive GK without previous fractionated whole brain external beam irradiation and had available follow-up information and diagnostic imaging. We then identified patients with and without radiographic evidence of recurrence. Pre-treatment and first post-treatment MRIs were obtained and co-registered utilizing a deformed image registration algorithm. The brain tumors were manually delineated to define regions of interest (ROI) for analysis of changes in apparent diffusion coefficient (ADC) between pre- and post-treatment MRIs. ROIs within normal brain tissue were utilized to develop a 95% confidence cutoff to determine significant changes in ADC. The percentages of tumor volume with increased, decreased or no change in ADC were calculated. Changes in ADC of tumors that recurred were compared with changes in ADC of tumor that did not recur.

## RESULTS

Preliminary findings suggest that there may be increased ADC changes in tumors that did not recur and less ADC changes in tumors that recurred. In a representative patient with tumor recurrence, the percent of tumor volume with no, decreased and increased significant ADC changes were 66.4%, 22.5% and 15.1%, respectively. In a representative patient without tumor recurrence, 32.8% of the tumor had increased ADC, 29.5% had decreased ADC, and only 37.7% without significant ADC change.

## CONCLUSION

Tumors that recurred exhibited a smaller proportion of tumor experiencing a significant change in ADC as compared to tumors that did not recur early. Further data is being collected which would allow for additional statistical analysis. The goal is to identify a threshold of ADC change in tumors after treatment that correlated with recurrence, which could allow for early assessment of treatment response.

# Treatment of Elderly Patients with Levodextroscoliosis with Minimally Invasive Surgery (MIS)

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## INTRODUCTION

Scoliosis is a common medical condition that causes deviation in a patient's spinal axis. Lumbar degenerative scoliosis is the most frequent presentation in adults, and is due to asymmetrical degeneration of discs, osteoporosis, and vertebral body compression fractures. Traditionally, invasive surgeries for degenerative scoliosis included the full curve fusion, which corrected the spinal curvature, but often resulted in complications. This retrospective study investigates the role of focused MIS approach for lumbar scoliosis in the elderly and evaluates patient outcome scores and success rates.

## METHODS

This retrospective study included 30 elderly patients (20F, 10M, mean age 76) with long-standing scoliosis, who presented to our clinic after only recently experiencing debilitating low back pain from a variety of co-morbid pathologies, including stenosis (28 patients), spondylolisthesis (10 patients), and disc-herniation (3 patients). CT myelogram was used in determining the source of symptoms. Outcomes were analyzed using the Visual Analog Scale (VAS), Short Form-36 Physical (PCS) and Mental (MCS), and Oswestry Disability Index (ODI) scores, preoperatively and postoperatively at 2 weeks, 1 month, 3 months, 6 months, and 1 year.

## RESULTS

Patients underwent MIS with adequate decompression and disc height restoration to open the canals and neural foramina bilaterally between 1-3 total spinal levels, with most common level being L4-5. A morselizing autograph for bone fusion material was used, which is non-inflammatory, leads to laminar remodeling, and arthrodesis. At 6 months, the Cobb angle improved from 20.7 to 15.5, lumbar lordosis changed from 47.4 to 55.9, and pelvic incidence changed from 56.9 to 57.9. At 1 year, VAS was improved from 4.4 to 3.1 (29%), ODI was improved from 38.1 to 25.8 (32%), SF-36 PCS was improved from 34.0 to 40.4 (19%), and SF-36 MCS was improved from 43.2 to 52.9 (23%). Patients showed long-term improvement from preoperative baseline and all outcomes scores were statistically significant with  $p < 0.001$ .

## CONCLUSION

Focused MIS approach can effectively treat the elderly population with debilitating symptoms from levodextroscoliosis. After identifying the etiology of patient's symptoms with CT myelogram, MIS produced favorable patient outcomes and reduced surgical morbidity.

# Factors Associated with Lean Mass Changes in Obese Adults Following Bariatric Surgery

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## INTRODUCTION

Bariatric surgery for morbid obesity results in significant body composition changes, with reductions in fat and lean mass. Minimizing lean mass loss has health benefits, including improved muscle strength, insulin sensitivity, and resting metabolic rate. However, factors associated with preservation of lean mass during rapid weight loss are not well defined. The primary objective of this study is to identify factors associated with relatively greater preservation of lean mass at 1-year post-bariatric surgery.

## METHODS

This retrospective study examined changes in body composition after bariatric surgery in adult obese patients. Pre-operative and 1-year post-operative body composition was measured via dual-energy x-ray absorptiometry (DXA) scans. Individuals that underwent gastric bypass or gastric sleeve bariatric surgery at Beaumont Hospitals in 2012 and 2013 and that completed the two DXA scans were included in the study (N=38). Other factors assessed included age, presence of type 2 diabetes, weight change, self-reported protein intake, self-reported participation in regular exercise, and serum pre-albumin and glycosylated hemoglobin (HbA1c) levels at specified time intervals following surgery.

## RESULTS

At 1-year post-bariatric surgery, the mean percent total body weight loss was  $28\% \pm 0.08\%$  and mean percent lean mass loss was  $16\% \pm 0.06\%$ . On evaluation of lean mass loss relative to total weight loss, those in the highest age quartile had a greater relative lean mass loss than those in the lowest age quartile, with 45% versus 29% losses, respectively ( $p=0.022$ ). Those with type 2 diabetes approached having significantly greater relative lean mass loss than those without diabetes, with 36% and 27% losses, respectively ( $p=0.053$ ). A higher degree of self-reported regular exercise during weight loss approached a significant correlation with lower lean mass loss ( $r=0.32$ ,  $p=0.054$ ).

## CONCLUSION

Younger age was associated with lower lean mass loss at 1-year post-bariatric surgery. Presence of type 2 diabetes may be associated with greater lean mass loss, and regular exercise appears to be associated with lower lean mass loss.

# Determining a Total Air Kerma Threshold to Calculate Peak Skin Dose in Cardiac Catheterization Procedures

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## INTRODUCTION

There is a risk of potential skin injury after prolonged procedures that use angiography equipment. Peak skin dose > 3000 mGy is considered the best predictor of skin injury. Prior studies demonstrated the factor total air kerma (Gy) as the best predictor of peak skin dose greater than 3 Gy in interventional radiology procedures. As cardiac catheterizations utilize more frequent beam angulation than interventional radiology procedures, we look to define a threshold of total air kerma of which a peak skin dose calculation should be considered mandatory in interventional cardiac catheterization procedures.

## METHODS

Between January 1, 2013 and December 31, 2013, 291 consecutive patients had interventional cardiac catheterization procedures that exceeded a total air kerma of 4000 mGy. These procedures were done in 5 cardiac catheterization labs located at Beaumont Hospital Royal Oak. The qualified medical physicist identified the beam angles that overlap and expose the skin to the highest dose in mGy. The proportionate amount of total air kerma (TAK) was used to estimate the patient specific peak skin dose (PSD).

## RESULTS

The average TAK was 5514 mGy +1385 (4022-11632). The average calculated PSD was 2254 mGy +1028 (557-6963). 60 patients (60/291, 21%) had PSD calculations >3000 mGy. In the TAK range of 4000-5000 mGy (135 of 291 patients), 9 patients (9/291, 3%) had PSD calculations >3000. No skin injury was reported for the 291 patients.

## CONCLUSION

A total air kerma of 5000 mGy is a good predictor of a peak skin dose of 3000 mGy and can be used as a mandatory threshold in calculating PSD in cardiac catheterization procedures. Since a large number of patients are in the TAK 4000-5000 range, the utilization of a TAK threshold of 5000 mGy would reduce the amount of PSD calculations and FTE hours.

# **Clinical and Financial Benefits of Implementing Enhanced Recovery After Colorectal Surgery**

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## **INTRODUCTION**

The Enhanced Recovery After Surgery (ERAS) program was developed to minimize complication rates and patient recovery time by various perioperative strategies. Although ERAS is clinically beneficial, less than one third of the surgeries in the United States utilize it. Appraising the details of financial benefit of ERAS for colorectal surgery may offer hospitals a better alternative to the current traditional care.

## **METHODS**

219 patients who received colorectal surgery from one of five surgeons at Troy Beaumont from June 2014 to August 2015 after the implementation of ERAS were compared to 270 patients who received surgery the year before from the same surgeons. The study used data from the NSQIP database (National Surgical Quality Improvement Program). Variables collected in the NSQIP database for each patient were used for comparison and monetization of the hospital cost per patient before and after implementing ERAS. Several variables such as mortality, length-of-stay, urinary tract infection, surgical site infection, and unplanned return, were closely monitored.

## **RESULTS**

Implementing the ERAS program for colorectal surgery led to an average increase in hospital revenue of \$2,039 per patient compared to the previous year. Adjusting the revenue for the severity of patients for both groups showed an average increase in hospital revenue of \$682 per patient enrolled in ERAS. Length of hospital stay decreased from 4.87 days to 4.63 days. Mortality and urinary tract infection remained 0 for both groups. Surgical site infection cases were 8 in ERAS and 9 in pre-ERAS. Readmissions were nine cases for each group.

## **CONCLUSION**

The ERAS program for colorectal surgery decreased the length of hospital stay with minimal to no changes in morbidities, mortalities, and readmission while increasing the net hospital revenue per patient. The initial ERAS implementation costs can also be offset as more patients are recruited into the program. The clinical and financial benefits of ERAS program offer hospitals and patients a method of care that is better than traditional care.

# Assessing Caregiver Perceptions of Physician Communication with Disabled Patients

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## INTRODUCTION

Many physicians do not have a great deal of experience treating physically and mentally disabled pediatric patients. Interactions between physicians and severely disabled patients may have an unintended negative effect on the relationship with the impaired patient or his/her caregiver. The purpose of this study is to examine the perceptions that caregivers of disabled pediatric patients have regarding the communication with their child's physicians.

## METHODS

This study utilizes a mixed-method design employing a quantitative and qualitative survey as well as a qualitative focus group protocol. Study participants included all parents or legal guardians of disabled students at Wing Lake Developmental Center. A focus group session consisted of a set list of questions based on recurring themes incorporated in the survey. Descriptive statistics including frequencies and t-tests were used to analyze the quantitative survey data. Pairwise comparisons were made between all medical specialties. Qualitative survey responses and focus group transcripts were coded for emerging themes and analyzed via statistical frequencies.

## RESULTS

129 surveys were sent home to participants in their child's school folder and 34 (26.4%) surveys were returned for analysis. Overall, caregivers were content with their physician's knowledge, respect and compassion, and truth and honesty, especially with Physical Medicine and Rehabilitation specialist physicians. However, improvements were needed in clearly articulating future management plans and allowing enough time for caregivers' questions to be addressed.

## CONCLUSION

This study demonstrates that caregivers were content overall with the care given by physicians to their physically disabled and cognitively impaired children, but improvements in their methods of communication with the caregivers and time allotments were needed to enhance the physician-patient relationship for this patient subset.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Analyzing Outcomes of Ventral Hernia Repair with Biologic Mesh

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## INTRODUCTION

Currently there are no studies comparing the types of biologic mesh used in patching abdominal hernias from an unbiased standpoint. Each type of biologic mesh has unique characteristics including materials it is made from and how it is specifically organized to help wound healing. This study will use biologic mesh as the independent variable to compare outcomes using different types of biologic mesh.

## METHODS

The number of patients with previous ventral hernia repair were obtained by a coding specialist at William Beaumont Hospital. Coding for ventral hernias includes only open surgeries. These were then sorted for only surgeries that included biologic mesh. These patients' charts were extrapolated into data points reflecting exactly which type of mesh the surgeon used to patch the hernia. Short term and long term complications were followed to assess if there was variance among the types of mesh used. Examples include mesh infection, hernia recurrence, and readmission. Charts from ventral hernia repairs dating back to January 1, 2000, to June 15, 2013 performed by all surgeons in the Beaumont system were analyzed. This alleviated technique and surgeon bias.

## RESULTS

Approximately 500 patient charts were analyzed for short and long term complications status post ventral hernia repair with biological mesh. At this time, only patients with synthetic meshes have been identified and further data collection is needed to support our hypothesis. However, we still anticipate results showing a human dermis biological mesh to show improved outcomes compared to bovine or porcine meshes.

## CONCLUSION

While preliminary observations indicate that patient outcomes are improved with utilization of human dermal mesh as compared to mesh composed of porcine or bovine mesh, further data collection is warranted.

# Determining the Risk Factors and Maternal/Neonatal Outcome Correlates of Patients Undergoing Induction

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## INTRODUCTION

The frequency of induction of labor (IOL), a common obstetrical procedure, is increasing in the U.S. for various reasons, and may increase the risk of adverse outcomes. This research aims to determine the factors that increase the risk of a failed induction and an induction's correlation to neonatal and maternal outcomes in the Beaumont Health System.

## METHODS

This retrospective study evaluates 1208 female patients who received induction, and 4418 female patients with spontaneous labor as the control group. The factors studied are in four categories: demographics/prenatal morbidities, intrapartum factors, fetal heart rate patterns, and umbilical blood gases/neonatal factors. These outcomes are assessed using student T-test for continuous variables and Chi squared test for discrete variables.

## RESULTS

The results demonstrated that the following factors are associated with IOL with statistical significance ( $p < 0.05$ ). The demographics are higher BMI, drug use, single status, smoking exposure, diabetes in pregnancy, chronic hypertension, and severe and superimposed preeclampsia. The intrapartum factors are higher max systolic and diastolic pressures, cesarean section, Gentamicin/Clindamycin use, insulin in labor, postpartum hemorrhage, premature rupture of membranes (PROM), delayed PROM, greater blood loss, and longer maternal length of stay. The fetal heart rate patterns are abnormal fetal heart rate coding, minimal variability, bradycardia, tachycardia, and early, prolonged, late, and variable decelerations. Finally, the neonatal factors are NICU admissions, length of stay of baby, birth weight, lower Apgar scores at 1 and 5 minutes, neonatal hypoglycemia, and lower oxygen concentrations and base excess in umbilical arteries and veins.

## CONCLUSION

The results demonstrate that inductions are more likely in patients with preexisting medical morbidities such as hypertensive disorders or gestational diabetes. They are positively associated with several demographic factors as well as intrapartum and postpartum outcomes. Inductions also seem to increase the risk of cesarean section and maternal and neonatal morbidities.

# Association of Hospital Characteristics with Outcomes of Patients Resuscitated After Out of Hospital Cardiac Arrest

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## INTRODUCTION

Substantial variation exists on the clinical approach to out of hospital cardiac arrest (OHCA) patients after return of spontaneous circulation (ROSC). Current AHA guidelines state that regional specialty centers for cardiac arrest care may be beneficial. Our objective is to explore the association of hospital characteristics with outcome in patients resuscitated from OHCA in a large and diverse US state.

## METHODS

We performed a retrospective study of adult patients admitted to Michigan hospitals with an ICD-9 admission diagnosis of cardiac arrest (427.5) or VF (427.41) between July 1, 2010 and June 30, 2013. We queried the Michigan Inpatient Database (MIDB), which collects data on admissions to all Michigan acute care hospitals, to obtain data (including demographics, clinical characteristics, and outcome (survival to discharge)). This data was combined with hospital characteristics (including ED volume (stratified by quartiles)), PCI capability, nursing Magnet designation, and verified trauma center status) obtained from state regulatory and national certifying bodies. Records with missing data were excluded and the combined dataset was analyzed using multivariate logistic regression.

## RESULTS

During the study period 4,173 patient records met criteria, of which 39.4% survived to hospital discharge. VF arrest (OR=3.01, 95% CI 2.56-3.54) was associated with increased odds of survival while cardiogenic shock (OR=0.42, 95% CI 0.33-0.52) and increasing age (per year OR=0.98, 95% CI 0.98-0.99) were associated with decreased odds of survival. Most hospital characteristics including level 1 or 2 trauma center status, nursing Magnet designation, cardiac surgery capability, and PCI capability were not associated with improved outcome. However, compared to the busiest quartile, hospitals with ED volumes in the 2nd busiest (OR=1.27, 95% CI 1.01-1.60) and 3rd busiest (OR=2.74, 95% CI 1.63-4.59) quartiles were associated with improved outcomes.

## CONCLUSION

Though limited by lack of pre-hospital data, using this large statewide dataset we did not demonstrate improved outcome for post arrest patients based on advanced hospital medical, surgical, or nursing characteristics. Further work is needed to assess whether hospital care provided rather than hospital characteristics improves post arrest outcomes.

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# Endoscopists do not Promote Scheduling Earlier Surveillance Colonoscopy Based on Patient Insurance

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## INTRODUCTION

Colorectal cancer (CRC) is the third most common cancer in the United States. To decrease its mortality, colonoscopy is the standard procedure for screening and surveillance of CRC. United States Preventive Services Task Force (USPSTF) guidelines are put in place to maximize patient safety and decrease overutilization. Studies reveal that practice patterns may differ from these guidelines. This study aims to identify relationships between epidemiologic and clinical factors, and colonoscopy surveillance intervals.

## METHODS

A retrospective review was conducted of 136 consecutive records of patients undergoing surveillance colonoscopy during August-December 2014 at Beaumont Health. Demographic information included gender, age, BMI, time interval between index colonoscopy and immediately prior colonoscopy, colonoscopy indication, insurance, number of polyps, polyp characteristics (size, location, and histology), endoscopist subspecialty, and comorbidities including hypertension, diabetes, and hyperlipidemia. The relation between these parameters and time intervals between colonoscopies were analyzed via one-way ANOVA using SPSS.

## RESULTS

Among the 136 patients (mean age  $66 \pm 9.4$  years), common primary insurances were Medicare (41.2%), and Blue Cross/Blue Shield (30.1%), with 13% having both insurances. The mean interval between colonoscopies for those insured with Medicare was  $31.4 \pm 14.5$  months vs. Medicare with Blue Cross Blue Shield or other secondary insurance was  $35.3 \pm 15.1$  and  $27.2 \pm 16.5$  months, respectively ( $p > 0.05$ ). The mean interval for colonoscopies performed by colorectal surgeons was  $32.9 \pm 14.5$  months vs. colonoscopies performed by gastroenterologists was  $35.6 \pm 21.1$  months ( $p > 0.05$ ). Both polyp number ( $r = -0.199$ ) and size ( $r = -0.384$ ) were significantly negatively correlated with interval between colonoscopies ( $p < 0.05$ ).

## CONCLUSION

The time interval between surveillance colonoscopies did not correlate with insurance or endoscopist specialty. Physicians did not demonstrate an economic discrimination in accelerating colonoscopy surveillance in patients with better-paying insurance. The number of polyps and size were negatively correlated with the time interval between colonoscopies, as increased quantity and magnitude are known to augment the risk of malignancy, and thus, the urgency of performing surveillance.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Assessing Patients' Knowledge of Their Health Care Team

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## INTRODUCTION

The extent to which hospital patients can correctly identify and understand the roles of the physicians providing their care is unknown. This pilot study investigated the ability of hospitalized patients to: 1) identify their attending physician by name or description, and 2) correctly describe the roles of the various physicians on their health care team.

## METHODS

Following IRB approval, participants were selected from a convenience sample of adults on one internal medicine and one general surgery unit at Beaumont Hospital in Royal Oak, Michigan. After consenting, participants were asked to identify (by name or description) their attending physician, as well as to define the role of an “attending physician”, “consulting physician”, “resident”, and “medical student”. Participants were then educated about and given a paper with the names and roles of the various physicians on their health care team.

## RESULTS

Of the 75 participants enrolled (50 medical & 25 surgical), 43 (57%) were able to correctly identify their attending physician. Of these, 36 (48%) were by name, and 7 (9%) were by description only. 26 medical (52%) and 17 surgical (68%) patients were able to correctly name or describe their attending physician ( $p=0.19$ ). 42 participants (56%) correctly defined “attending physician”, 55 (73%) – “consulting physician”, 37 (49%) – “resident”, and 70 (93%) – “medical student” ( $p<0.001$ ). 17 participants (23%) responded that residents are “students” and not “doctors”; this was the most common misconception identified.

## CONCLUSION

Only 57% of respondents were able to correctly name or describe their current attending physician. In addition, many patients were unable to identify the roles of various physicians on their health care team. These deficiencies may negatively impact the formation of the partnership needed to provide patient-centered care. It may be beneficial to educate patients about the identities and roles of the various physician and non-physician members of their health care team.

# **A Retrospective Analysis of Congestive Heart Failure 30 Day Re-Admissions**

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## **INTRODUCTION**

This is a retrospective analysis of William Beaumont Hospital patients admitted with the principle diagnosis of Congestive Heart Failure (CHF) who presented with repeat exacerbation within the 30-day window mandated by Centers for Medicare and Medicaid Services (CMS). Our goal was to identify potential interventions to reduce readmissions and improve quality of care.

## **METHODS**

A retrospective chart review was conducted of CHF patients over age 65, discharged to two nursing centers, who were readmitted to William Beaumont hospital within 30 days (n=59). Charts were evaluated according to several factors, including medications/errors, co-morbidities, length of stay, diet, discharge instruction availability, physician follow-up, and errors in diagnosis. SAS/STAT software was used to analyze data.

## **RESULTS**

Statistical analysis of data shows hypertension present in 100% of patients, type 2 diabetes in 44.1%, A- fib in 57.6%, CAD in 57.6%, CKD in 66.1%, asthma in 18.6%, and COPD in 27.1%. 37.3% of patients have since passed away and 54.2% had depression or were taking antidepressants. At sub-acute rehab, average physician follow-up occurred in 1.95 days with discharge summary available within 1 day 57.6% of the time and from 1 day to 1 week 25.4% of the time. No significant changes were made to any medications studied. 7.1% of patients were readmitted for CHF, 23.2% for dyspnea, and 62.5% for other causes.

## **CONCLUSION**

No faults in the hand-off process, diagnosis errors, or communication issues were identified. The majority of patients were readmitted for diagnoses other than CHF. With high levels of depression, the multiple comorbidities, and the high percent who have since become deceased, focusing more on quality of life may be beneficial to this population. Discussing end of life goals and palliative and hospice care and then working toward these goals could improve quality of life and lead to choices that may lower readmission rates.

# Assessing a Histological Connection between Dysplastic Nevi and Melanoma

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## INTRODUCTION

Dermatologists describe nevi on a spectrum, ranging from the benign type to malignant melanoma. Dysplastic nevi can be considered to lie somewhere in the middle of the spectrum of lesions. The malignant potential of dysplastic nevi has not fully been elucidated. A previous study has found that c-Myc expression, a regulator gene involved in the cell cycle, is increased in malignant melanoma while it is not expressed in benign nevi. This study was designed to analyze c-Myc expression patterns in dysplastic nevi as compared to malignant melanoma and benign nevi to determine if c-Myc expression is linked to the transformation of benign nevi to malignant melanoma.

## METHODS

Study samples were obtained from the Darien, IL based University Dermatology pathology lab from lesions that were previously excised based on clinical judgment. These Clarks Dyplastic samples, along with benign nevi and malignant melanoma samples, underwent immunohistochemistry staining and were read in duplicate under light microscopy to assess the expression pattern of c-Myc in the cytoplasm and nucleus. Expression patterns were analyzed using chi-square analysis.

## RESULTS

Significant staining differences in cytoplasmic stains occurred in the compound nevi Clarks Dysplastic type compared to benign compound nevi ( $p=0.0299$ ) and between junctional nevi Clark's Dysplastic type and benign junctional nevi ( $p=0.0389$ ). Staining within the nucleus resulted in significant differences between the compound nevi Clark's Dysplastic type and benign junctional nevi ( $p=0.0012$ ) as well as between junctional nevi Clark's Dysplastic type and benign compound nevi ( $p<0.0001$ ) and malignant melanoma respectively ( $p<0.0001$ ).

## CONCLUSION

The results demonstrate different expressions for c-Myc within all of the nevi types but fail to show a consistent pattern to help prognosticate dysplastic nevi overall. Future studies will be directed at expanding the sample size as well as further examining the different subtypes of malignant melanoma.

# **Incidence of Pocket Infection Postcardiac Device Implantation Using Antibiotic versus Saline Solution for Pocket Irrigation**

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## **INTRODUCTION**

Preprocedure systemic antibiotic prophylaxis reduces infections in patients undergoing cardiac implantable electronic devices (CIEDs) implantations. Whether pocket irrigation with antibiotic solution offers any advantage over saline solution in CIED implantation is unknown.

## **METHODS**

Records from 327 consecutive patients who underwent CIED implantation by three operators from February 2011 to January 2014 were reviewed. From February 2011 to January 2012, the antibiotic solution was used for pocket irrigation; from February 2012 to January 2014, saline solution was used. All patients received preprocedural IV antibiotics. Baseline demographics, comorbidities, lab data, and occurrence of any pocket infection postimplant were collected.

## **RESULTS**

There were 118 and 209 patients in the antibiotic solution and saline solution group, respectively. A total of four (1.2%) patients had CIED infection: two in the antibiotic solution group and two in the saline solution group. Median time to infection from implant date was  $81.5 \pm 35$  days. Two patients (50%) had infection after first device implantation. Of the four patients, one had positive blood culture, three had positive pocket cultures, one had lead vegetation, one underwent pocket exploration, and all of them had devices/leads extracted, with reimplantation on the contralateral side. No mortality was observed due to infectious complications.

## **CONCLUSION**

When compared to pocket irrigation in the antibiotic solution group, the saline solution group was not associated with increased incidence of infectious complications after CIED implantation. The use of saline solution pocket irrigation alone may be used in CIED pocket irrigation periprocedurally. Further evaluation in larger randomized trials is needed.

# Chronic Neuromodulation as a Treatment for Persistent Genital Arousal Disorder

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## INTRODUCTION

Persistent Genital Arousal Disorder (PGAD) is a rare condition that is characterized by unwanted, uncomfortable genital sensations and/or spontaneous ejaculation without physical or emotional stimulation. Although little is known about the etiology of PGAD and there is a lack of effective treatments, research suggests a potential correlation with pudendal nerve neuropathy. As a result, we evaluated the effects of pudendal nerve stimulation on PGAD symptoms.

## METHODS

A retrospective chart review was performed on patients with PGAD who underwent pudendal neuromodulation for symptom management. Demographic, operative and postoperative data were collected. In addition, a survey was sent to assess patient demographics, symptoms pre and postoperative, and overall patient satisfaction. Descriptive statistics were performed.

## RESULTS

Six female patients met inclusion/exclusion criteria. Mean age at implant was  $52 \pm 9$  years. 3/6 had a lead migration an average 13 days post-operative. 5/6 patients were still implanted at time of survey average of 38 months post implantation. One was removed due to non-use. 4/6 completed, returned surveys, and still used their device. Preoperatively, 4/4 patients had experienced symptoms continuously throughout the day. Postoperatively, 2/4 had symptoms only once per week, 1/4 continuously throughout the day, and 1/4 unknown. 4/4 indicated pudendal neuromodulation improved their PGAD symptoms. 3/4 met their treatment goals of reducing PGAD symptoms, and were satisfied with pudendal neuromodulation. 1/4 was only moderately satisfied with their treatment, however indicated they would undergo pudendal neuromodulation again. 4/4 patients, pudendal neuromodulation was considered more effective than pudendal nerve blocks. When asked to rate past treatments used for PGAD, 3/4 indicated pudendal neuromodulation was most helpful.

## CONCLUSION

Our preliminary study suggests that chronic pudendal neuromodulation may decrease the frequency of PGAD symptoms and provide symptomatic relief. Future prospective study is warranted.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Factors Affecting Disposition in Patients with Urinary Tract Stones at a Large Tertiary Referral Center

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## INTRODUCTION

Many patients present to the hospital for treatment of urinary tract stones. We explored factors associated with outpatient treatment in the emergency department (ED), inpatient urology, and inpatient medicine.

## METHODS

Patients age  $\geq 18$  years presenting to a large tertiary referral center (July 2011-July 2013) with calculus of kidney (ICD-9-CM 592.0) or ureter (592.1), or renal colic (788.0) were reviewed. Three groups: 1) outpatients with length of stay (LOS)  $\leq 24$  hours, 2) inpatients admitted to urology, and 3) inpatients admitted to medicine were compared with Pearson's Chi-square, Fisher's Exact, and Kruskal-Wallis tests. Those with LOS  $\leq 24$  hours vs. inpatient stay were evaluated with step-down logistic regression analysis.

## RESULTS

Of 2056 patients, 80.5% were treated as outpatients, 13.6% were admitted to inpatient urology, and 5.9% were admitted to inpatient medicine. The most common primary diagnosis for the ED outpatient group was calculus of the kidney, while for the inpatient urology and medicine groups it was calculus of the ureter. The group with the highest comorbidities was inpatient medicine (70.5%), followed by inpatient urology (34.6%), and ED outpatient (21.8%). The inpatient urology group underwent the most urologic procedures (60.7%) and had the greatest median cost at \$4304 versus \$3596 for inpatient medicine and \$655 for ED outpatient groups. The inpatient medicine group had the longest LOS (2.1 days), followed by inpatient urology (1.4) and ED outpatient (0.3). Multivariable analysis suggested that more comorbidities, being female, larger stone size, and having a diagnosis of calculus of the ureter were all strong predictors of inpatient stay.

## CONCLUSION

Most patients were treated in the ED. Patients admitted to urology had larger stones, more procedures, and greater costs, but lower LOS. The inpatient medicine group had the longest LOS and highest proportion of comorbidities. Further research of factors influencing disposition and outcomes is needed.

# **Retrospective Study of Gamma Knife Surgery Outcomes on Cerebral Arteriovenous Malformation Patients**

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## **INTRODUCTION**

Microsurgery is generally considered the gold standard treatment for cerebral arteriovenous malformations (AVMs). Patients with large and deeply located high grade AVMs, particularly in eloquent areas of the brain or with other medical-surgical risks, however, may instead be observed due to the potential risks of surgery. Gamma Knife radiosurgery is an alternative method of treatment that may be considered for such high-risk patients and can result in obliteration with subsequent reduction in the risk of hemorrhage and neurological complications compared to microsurgery.

## **METHODS**

Data was retrospectively collected from William Beaumont Hospital patients treated with Gamma Knife radiosurgery for AVMs. All patients were clinically and radiographically diagnosed and classified through the Spetzler-Martin AVM grading system. Patients with Grade I-V cerebral AVMs were included with multiple patient, treatment and outcome-related variables entered into a database. The variables include but are not limited to: AVM size, AVM location, Karnofsky Performance Status scale, symptoms, seizure frequency, previous radiosurgery treatment, and imaging results. The planned analysis will report patient characteristics, AVM obliteration rates, as well as treatment related complications. Obliteration and complication rates will be correlated with patient and treatment related factors.

## **RESULTS**

Preliminary overview of the data implies that Gamma Knife treatment can successfully obliterate cerebral AVMs including a latency period to obliteration with a reasonably low rate of complications.

## **CONCLUSION**

Gamma Knife radiosurgery can be used to obliterate cerebral AVMs and reduce the subsequent risk of hemorrhage in patients where microsurgery is deemed limited due to the location of the AVM.

# Incidence of Acute Kidney Injury and Association with Survival in Post-Cardiac Arrest Patients

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## INTRODUCTION

Acute kidney injury (AKI) following cardiac arrest is common although the incidence is unknown. Our research investigates AKI in patients treated with therapeutic hypothermia (TH) following cardiac arrest and its relationship with survival to hospital discharge.

## METHODS

Adult, non-traumatic, post-cardiac arrest patients admitted to the Cardiac Intensive Care Unit at two large community hospitals between January 2009 and May 2015 were considered for inclusion. Patients were treated with the same post-cardiac arrest care regardless of arrest location and presenting rhythm. AKI was determined using Kidney Disease Improving Global Outcomes (KDIGO) criteria. This analysis used a novel method for determining AKI criteria including the use of a dynamic baseline creatinine value that changed based on the period of analysis (48 hour or 7+ days) and that continued throughout the patient's admission. KDIGO scores range from 0 (best) to 3 (worst). Descriptive statistics and Chi-Square results are presented.

## RESULTS

A total of 184 patients received TH, average age 62.0 years (SD 15.92) and 64% were male. The majority of patients 129/184 (70%) presented with a non-shockable rhythm; 58/184 (32%) survived to hospital discharge. Patient distribution of KDIGO scores included: category 0, n=46; 1, n=66; 2, n=26; 3, n=46. There was no significant association between KDIGO category and survival to discharge (Chi-Square 5.69, p=0.13). There were fewer survivors in category 0, which was contrary to expectation.

## CONCLUSION

AKI as defined by KDIGO category was not significantly related to survival in this cohort. Future studies evaluating the impact of TH on minimizing AKI are needed.

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# **Prevalence and Associated Cost and Utilization of Multiple Chronic Conditions in the Outpatient Setting among Enrollees of an Employer-based Health Plan**

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## **INTRODUCTION**

Multiple chronic conditions (MCCs) patients are a significant concern for the U.S. healthcare system. Research on MCC patients has been conducted using large, nation-level datasets. The purpose of this analysis was to calculate MCC prevalence, and to determine the relationship between MCCs and cost and utilization in the outpatient setting among enrollees of a regional, employer-based health plan.

## **METHODS**

Outpatient claims for patients  $\geq 18$  years from the Beaumont Employee Health Plan (BEHP), a regional health plan serving Beaumont employees and their families across Southeastern Michigan, were analyzed to study MCC prevalence, cost and utilization for the years 2008-2013. We examined the crude and adjusted relationship between MCCs and cost, outpatient visit frequency, and days between appointments using linear regression. Using the year 2008 as a reference, odds ratios for MCC occurrence were calculated for each year of the study period using multiple logistic regression, adjusted for age and sex.

## **RESULTS**

Among 34,190 patients, 43.0% (n=14,714) had zero chronic conditions, 23.8% (n=8,145) had one chronic condition, and 33.1% (n=11,331) had  $\geq 2$  chronic conditions. Greater numbers of chronic conditions were associated with cost ( $\beta=571.7$ ,  $p<0.001$ ), outpatient visit frequency ( $\beta=9.4$ ,  $p<0.001$ ), and days between appointments ( $\beta=-21.6$ ,  $p<0.001$ ), in adjusted models. Compared to 2008, the adjusted odds of MCC occurrence in 2013 was 0.87 (95% CI: 0.82-0.92). From 2008 to 2013, the average cost (\$463.3 to \$966.8) and number of visits (8.5 to 14.6) associated with MCC patients increased two-fold, while average days between appointments decreased approximately two-fold (57.5 to 32.6).

## **CONCLUSION**

Adult MCC patients are associated with increased cost and visits, as well as decreased time between appointments in the outpatient setting. Identifying combinations of MCCs that are associated with high cost and utilization can provide opportunities for targeted intervention.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

*Recipient of the Ravitz Foundation Capstone Research Manuscript of the Year.*

*Embark Capstone Colloquium Speaker.*

# **Haloperidol and Lorazepam Intramuscular Injection Trends for Behavioral Emergency Situations in an Acute Care Rehabilitation Facility for Adolescents**

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## **INTRODUCTION**

Acute agitation in the form of aggression or self-harm is a serious obstacle in treatment for adolescents in acute care rehabilitation facilities. Interventions such as restraints, seclusions, and intramuscular injections are aimed to be minimally used as they do not treat the underlying condition or illness, and are viewed as last resort options when there are significant safety concerns for the patient, others. This study investigates the use of IM injections of combined haloperidol and lorazepam to identify possible variables in a patient's legal and medical record that may correlate with an increased risk of receiving multiple IM injections during treatment.

## **METHODS**

A retrospective chart review of 63 patients (13 to 17 years of age) was conducted at an adolescent rehabilitation facility in Michigan from May 2011- May 2013. The patients collectively received a total of 202 IM injections. Data analysis aimed to investigate whether any variables (DSM-IV axis I-IV disorder, juvenile record, prior hospitalizations, and other social history variables) correlated with the numbers of IM injections during care. Statistical analysis used Negative Binomial Regression to calculate incident rate ratios (IRR), or how much more likely a subject was to receive an injection when a certain variable was present.

## **RESULTS**

Increased numbers of IM injections were significantly associated with a diagnosis of schizophrenia (IRR: 4.04; p-value = 0.002), a diagnosis of a bipolar disorder (IRR: 1.65; p-value = 0.026), prior IM injection (IRR: 3.66; p-value = <0.001), substance abuse (IRR: 2.48; p-value = <0.001), and having a juvenile record (IRR: 2.11; p-value = 0.001).

## **CONCLUSION**

Our study indicates several, easy to document clinical features that may predict which patients are at significantly higher risks for multiple future IM injections during their acute psychiatric and rehabilitation management. Such information may help focus the use of early therapeutic interventions aimed to reduce the number of IM injections an adolescent will receive.

# Margins in Breast Conserving Surgery: The Financial Cost & Potential Savings Associated with the New Margin Guidelines

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## INTRODUCTION

The definition of clear margins, for patients diagnosed with breast cancer who undergo a lumpectomy, has been an area of controversy for years. Recently, a consensus statement by the Society of Surgical Oncology and American Society for Radiation Society defined clear margins as 'no ink on tumor'. In this study, we compared indications for re-excision and findings of additional tumor in the re-excision specimen as they related to margin status, as well as costs associated with re-excision based on recent new consensus statements.

## METHODS

A retrospective analysis was performed on 462 patients with invasive breast carcinoma who underwent lumpectomy between January 2011 and December 2013. Postoperative data was analyzed based on additional disease found, as it related to margin status of initial lumpectomy and direct costs associated with additional procedures.

## RESULTS

Of 462 patients sampled, 149 underwent a re-excision surgery (32.2%). In the 40 patients with additional disease found on re-excision, 36 (90.0%) had a positive margin on initial lumpectomy. The mean cost of the initial lumpectomy for all 462 patients was \$2,118.01 plus an additional \$1,801.92 for those who underwent re-excision.

## CONCLUSION

A positive margin was most predictive of finding residual tumor on re-excision. Using old criteria only 0.07% (4/61) of patients who had undergone re-excision with a 'clear' margin, had additional tumor, at a total cost of \$106,354.11. Thus, the new consensus guidelines will lead to less overall cost, at no clinical risk to patients, while reducing a patient's surgical risk and essentially eliminating delays in adjuvant care.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Migraine in the Emergency Department: Is It the Same for Children as for Adults?

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## INTRODUCTION

Migraine headaches affect all ages, commonly resulting in visits to the Emergency Department (ED). Few studies have directly compared details of ED visits for all ages. The study objective is to compare ED visits for migraine based on demographics, diagnosis, treatment protocols, and follow-up.

## METHODS

A retrospective electronic chart review performed on all visits at two Detroit EDs within the same healthcare system with chief complaint of either "headache" or "migraine" identified by ICD-9 code for the year of 2013. Data extracted from each visit included, demographics, past medical history, drug treatment, pain scores, radiographic imaging, ED length of stay, disposition, and return visits for same complaint within 72 hrs. The data was analyzed to identify any possible trends by comparing pediatric to adult patients and then comparing subgroups of ages in each category.

## RESULTS

Data showed 4474 patient visits of interest. Of these, 669 patients (59% Female) were pediatric ages (0-18) and 3804 patients (75% Female) were adult ages (19 to 98). The majority of patients were 19-64 years old (70%). Pediatric patients received a CT head on 24% of visits while adults received 58%. Pediatric patients had a length of stay almost half as long as adults (3.69±2.95 hours vs 6.95±6.88 hours; p <.001). For treatment, 86% of peditrics compared to 94% of adults received any form of medication or IV fluid. The majority in both age groups received a NSAID for treatment, however there was no other treatment trend that the majority in both groups received. Overall, adults received more treatment medications (3.84± 2.06 vs. 2.40 ± 1.90; p-value <.001). The majority of all patients were discharged from the ED.

## CONCLUSION

Most patients, regardless of age, are discharged from the ED after being treated for migraine. Adult patients, on average, stay twice as long as pediatric patients, have imaging twice as much, and receive more medications than children.

# The Impact of EMS Driven Pre-Arrival Activation on Morbidity of ST-Elevation Myocardial Infarction (STEMI) Patients

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## INTRODUCTION

Research has shown that decreased time to identify the early reperfusion of the heart after Acute Myocardial Infarction (AMI) improves outcome. The objective in this study is to look at the impact of Emergency Medical Services (EMS) driven pre-arrival activation of the hospital AMI team on morbidity for ST-Elevation Myocardial Infarction (STEMI) patients by measuring ejection fractions and 6-month cardiac related readmissions.

## METHODS

This observational study was performed within the William Beaumont Hospital system with data derived from the Royal Oak campus and Troy Campus. Both campuses have 24/7 cardiac catheterization labs, and multi-disciplinary AMI teams. The AMI team was activated by emergency physicians (EPs) either pre-hospital activation-based on transmitted electrocardiogram (ECG) or via paramedic verbal report or after ED Arrival. All patients had EMS ECG. Patient excluded if Do Not Resuscitate; non-diagnostic ECG, Left Bundle Branch, or patient driven delays to care. Treatment time intervals, including Door to Balloon (D2B) time and EMS Scene-Arrival to Balloon (S2B) time, ejection fractions and 6-month readmissions were collected.

## RESULTS

A first pass of the data has been completed. P values will be used to determine statistical significance. Ejection fraction variables have been categorized as normal, mild dysfunction or severe dysfunction. Total 6-month readmissions have been collected and organized into dichotomous variables varied by whether or not readmissions were due to cardiovascular causes.

## CONCLUSION

We anticipate that decreased D2B time via pre-hospital EMS activation will show improved myocardial ejection fractions and minimize the number of 6-month hospital readmissions compared to cases in which activation was delayed until hospital arrival.

# Trends in Adoption of Femtosecond Laser-Assisted Cataract Surgery Among Michigan Cataract Surgeons

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## INTRODUCTION

The current preferred method of cataract surgery involves conventional phacoemulsification, in which ultrasound is used to break a cataract into small fragments that are then removed. Recently, the femtosecond laser-assisted cataract surgery system (FLACS) has been introduced. However, the use of FLACS has been primarily in academic settings. This study examines physicians' attitudes towards adopting FLACS and the potential barriers physicians face when transitioning to the new system.

## METHODS

A 17-question survey was created and distributed through email to 315 members of the Michigan Society of Eye Physicians and Surgeons (MiSEPS). Only members who are cataract surgeons and who perform cataract surgery regularly were asked to complete the survey. Subsequent surveys were distributed to this subset every 6 months for 1.5 years (March 2015-June 2016). Once responses were gathered, data from every 6-month time point were compared in order to identify trends of adoptive rates.

## RESULTS

Survey responses did not show statistically significant trends when comparing the survey responses from each time point due to low participation. However, the data suggest some possible trends. Decreased efficiency of patient flow in the operating room as a barrier to using FLACS became slightly more impactful over time between Round 1 and Round 3 (71.4% most impactful in Round 1 to 100.0% most impactful in Round 3).

## CONCLUSION

The results of the survey did not reveal statistically significant trends in cataract surgeons' attitudes towards adopting FLACS over time. However, the data suggests improving patient flow in the operating room when using FLACS may impact the use of FLACS in the future. This study aided in the examination of perceived advantages and disadvantages of using FLACS in the Michigan cataract surgeon community.

# Combining Radiofrequency Ablation, Vertebroplasty, and Radiation Therapy to Treat Spinal Metastases

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## INTRODUCTION

The spine is the most common site of bone metastasis, which often results in significant back pain and reduced quality of life. The standard of care for metastatic spinal tumors is radiation therapy (RT), however recent studies suggest this may increase the risk of vertebral compression fractures (VCF). Radiofrequency ablation uses thermal energy to destroy tumor cells and is routinely combined with vertebroplasty to enhance bone stability. Currently, there is minimal data in the medical literature on combining RT with radiofrequency ablation and vertebroplasty (RFAV) to treat spinal metastases.

## METHODS

This was a prospective study of four participants with twelve spinal metastases (6 thoracic, 6 lumbar) between the T5-L5 vertebral levels who underwent RFAV and RT. Mean age of participants was 52.5 years (range: 37-64). Mean dose of radiation was 27.1 Gy (range: 18-35) in a mean fraction of 7.1 (range: 1-14). Pain levels were reported using the Numerical Rating Scale (NRS) and quality of life was assessed with the Oswestry Disability Questionnaire (ODI). Data were collected before treatment and at four subsequent time points with a final mean follow up of 12.3 months (range: 11.3-13.9).

## RESULTS

Technical success was achieved in 100% of patients with no peri-operative complications. Changes in ODI score 3 months, 6 months, and 12 months post-treatment were: mean -11.0 (min -2, max -20)  $p=0.079$ , mean -6.7 (min -2, max -10)  $p=0.109$ , and mean -21.3 (min -10, max -33)  $p=0.047$ , respectively. Changes in NRS pain level 3 months, 6 months, and 12 months post-treatment were: mean -2.67 (min -2, max -4)  $p=0.057$ , mean -1.0 (min -1, max -1)  $p<0.01$ , and mean -4.0 (min -2, max -6)  $p=0.022$ , respectively. No participants developed new or progressive VCF at the levels of treatment, and local tumor control was achieved in all patients.

## CONCLUSION

This study supports that the combination of RFAV and RT is safe for treating spinal metastases and effective for improving quality of life. The observed combined therapeutic effects are potentially greater than any single treatment modality alone.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Clinical Outcomes Following Radiation Therapy in Endometrial Cancer

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## INTRODUCTION

Endometrial cancer (EC) is common, with ~42,160 cases diagnosed in the US annually. Depending on FIGO stage, different adjuvant radiation treatment (RT) modalities are utilized, including external beam RT (EBRT), high-dose-rate brachytherapy (HDR-BT) or a combination. The purpose of this study is to evaluate clinical outcomes following RT for women with EC.

## METHODS

670 women with EC were treated with RT at a single institution from 1974–2014. Data was retrospectively reviewed. Patients with distant metastasis (DM), recurrence, or carcinosarcoma histology were excluded. Clinical outcomes analyzed include 5-year local control (LC), regional control (RC), vaginal-only recurrence (VR), DM, cause-specific survival (CSS), and overall survival (OS).

## RESULTS

A total of 314 patients were included. Median follow-up was 4.8y (0-22y) for all patients. Median age was 65 (31-87). 56% of patients had FIGO stage I, 18% stage II, 16% stage III, and the remaining stage IV disease. The majority of patients had node-negative disease (68%), while 9% had node-positive disease, and 22% with unknown nodal status. RT included EBRT (n=23), HDR-BT (n=176), or combination treatment (n=123). Chemotherapy was given in 21% of patients. Outcomes for EBRT were: 82% LC, 91% RC, 19% VR, 42% DM, 74% CSS, and 53% OS at 5-years. Outcomes for HDR-BT were: 94% LC, 97% RC, 6% VR, 6% DM, 97% CSS, and 93% OS. Outcomes for combination treatment were: 95% LC, 97% RC, 6% VR, 7% DM, 94% CSS, and 82% OS.

## CONCLUSION

The type of adjuvant RT given for EC is highly dependent on FIGO stage, therefore direct comparison of clinical outcomes for each of the RT modalities cannot be made. However, the data indicate high rates of LC and CSS/OS regardless of RT modality. Further analysis comparing toxicity between the 3 treatment modalities would provide useful information given the excellent overall outcomes for patients with EC.

# **Cost and Clinical Efficacy of Protocolized Routine Order Bundle for Bronchoalveolar Lavage**

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## **INTRODUCTION**

The objective of this study was to evaluate the utilization of the bronchoalveolar lavage (BAL) order panel, including an assessment of the frequency it is ordered in patients undergoing bronchoscopy and further categorized by clinical indication for the BAL testing, the presence of positive and clinically relevant results, and the impact of these results on patient care.

## **METHODS**

A retrospective study of patients undergoing bronchoscopy with BAL in 2013 at Beaumont Hospital, Royal Oak was conducted. Patients who had specimens from the BAL sent for the BAL order panel were assessed for positive results. The clinical relevance and the clinical impact of these results were subsequently determined by the authors.

## **RESULTS**

There were 697 bronchoscopies performed in 2013; 319 of them had the BAL order panel ordered. Of those with the entire panel ordered, 50 were determined to have at least one positive result. From the 50 with positive results, the entire order panel was determined to be indicated in 17, a subset of the order panel was determined to be indicated in 20, and none of the order panel components were felt to be indicated in 13. In this latter group, none of the results were determined to be clinically relevant.

## **CONCLUSION**

Our study demonstrated that selective use of the BAL order panel in patients with specific clinical indications would not result in missed diagnoses and it may reduce unnecessary care. Viral studies for the bronchoalveolar lavage protocol should be limited to patients presenting with indications for the entire protocol.



# LABORATORY RESEARCH ABSTRACTS

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# **Radiation Therapy for Alzheimer's Disease: Influence on Beta Amyloid and Synaptophysin Expression**

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## **INTRODUCTION**

Alzheimer's disease (AD) is a common form of dementia associated with diffuse cerebral beta amyloid deposition and declining memory function. Synaptophysin expression in the hippocampus correlates with retention of memory function in the setting of AD. Radiation therapy has been effective for treating amyloid deposition in other organs. Our study aims to explore whether treatment of cerebral beta amyloid deposition with radiation therapy influences memory function and synaptophysin expression in a murine model of AD.

## **METHODS**

Twelve transgenic mice were bred to express the AAPSwe mutation associated with familial AD. All mice underwent memory testing using the Morris water maze. Seven mice received a fractionated radiation dose of 2GyX5. The remaining five animals were kept as controls. Morris water maze testing was performed again post radiation therapy. All 12 mice were sacrificed and their brains dissected and embedded in paraffin for tissue studies. Beta amyloid and synaptophysin expression were visualized using immunohistochemistry (IHC) and Definiens image processing technology.

## **RESULTS**

Irradiated mice performed significantly better ( $p=0.012$ ) than controls on the timed Morris water maze test. Beta amyloid mean plaque counts were reduced in the irradiated group (mean 3470) versus the control group (mean 5804), which was found to be statistically significant ( $p=0.05$ ). Synaptophysin staining intensity was significantly reduced ( $p=0.033$ ) in the CA1 region of the hippocampus, with CA2, CA3, and dentate gyrus regions showing no significant difference between experimental and control groups.

## **CONCLUSION**

Radiation therapy in this model of AD resulted in improved memory function, altered synaptophysin expression, and decreased beta amyloid expression in the experimental group. Radiation therapy holds promise as a potential novel therapy for AD.

# The Impact of Freezing and Storing on Antibiotic Sensitivity of Human Pathogens

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## INTRODUCTION

Research on antibiotic resistance involves studying multiple bacterial strains and frequently requires long-term frozen storage. Edwards and colleagues observed increased susceptibility to antibiotics after revival and propagation of some stored bacteria, which could call into question research on resistant organisms. In this study, we aimed to determine if *Enterococcus faecalis*, methicillin-resistant and sensitive *Staphylococcus aureus* (MRSA and MSSA, respectively) exhibit this altered susceptibility after freezing, the impact of the duration of freezing on this phenomenon, and which classes of antibiotics this phenomenon applies to.

## METHODS

The susceptibilities to different antibiotics of four clinical isolates each of *E. faecalis*, MRSA and MSSA were measured after being stored at -80°C for ten days, one month, and nine months. They were then compared to their initial susceptibilities and to the strain propagated without freezing. To determine the susceptibilities, the minimum inhibitory concentration (MIC) of the antibiotics was measured for each isolate in duplicate using the broth microdilution method. A significant change in susceptibility was defined as at least a two dilution difference in MIC after freezing and storage.

## RESULTS

The MRSA isolates showed no change in susceptibility to vancomycin, daptomycin, or nafcillin. One isolate of MSSA showed decreased susceptibility to nafcillin after being frozen for nine months. Three isolates of *E. faecalis* displayed increased susceptibility to daptomycin, which was first observed from ten days to nine months of freezing and storage. One isolate of *E. faecalis* demonstrated decreased susceptibility to piperacillin/tazobactam after nine months.

## CONCLUSION

Only *E. faecalis* exhibited increased susceptibility to an antibiotic, specifically daptomycin, over different durations of freezing and storage. These observations suggest increased susceptibility to antibiotics after freezing and storage is likely dependent upon the species of the pathogen and the class of antibiotic being studied, but not necessarily the duration of freezing.

# GLOBAL AND COMMUNITY HEALTH RESEARCH ABSTRACTS

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# Mental Health Help-Seeking Behavior of Muslim Americans

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## INTRODUCTION

The Muslim American Community is much less likely to seek out mental health care due to stigma, misconceptions, and shame. This investigation seeks to determine their views on seeking care and analyze if education, gender, age, or provider status are correlated with more/less positive views. Also, it will gauge effectiveness of interventions.

## METHODS

The survey Attitudes Towards Seeking Professional Psychological Help (Fischer & Turner, 1970) was administered to individuals (n=37) at the Muslim Mental Health Conference, consisting primarily of Mental Health Professionals. The same survey was administered in the community at large (n=108): local intervention (n=29) and during ISNA Conference (n=79). T-tests were used to determine whether there was any relation between demographic variables and positive views towards help-seeking, measured in 4 subcategories: Recognition of need for psychotherapeutic help, Stigma tolerance, Interpersonal Openness, and Confidence in Mental Health practitioner. The mental health professional group was compared to non-professionals via an independent samples t-test and a paired samples t-test was used to compare scores before and after the intervention.

## RESULTS

Mental health providers scored higher in total (M=58.4, SD=8.6;  $t(73.0) = -3.67, p < .001$ ) than others (M=52.0, SD=10.2), especially in recognition and openness. However, interestingly, they did not have higher confidence in mental health professionals. Regarding the intervention, it was discovered that a four-hour informational program and panel discussion led to significantly higher mean scores not only in total (M=57.6, SD=12.1 vs. M=51.1, SD=10.1;  $t(28) = -4.63, p < .001$ ) but across all four categories, especially, openness and recognition. Demographically, higher levels of education and ages 30-40 were associated with more positive views towards psychological help seeking.

## CONCLUSION

This study proves that local educational incentives are effective in increasing access to care by decreasing stigma and raising awareness among Muslim Americans and helps recognize some challenges to self-care amongst our own providers.

# What Factors Influence Change in Glycated Hemoglobin Over Time in an Underserved Population?

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<sup>3</sup>Executive Director, Gary Burnstein Community Health Clinic

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## INTRODUCTION

Diabetes-related morbidity and mortality is higher in minority populations. Safety net health care institutions aim to reduce these risks but are presented with challenges. This study examines influences on glycated hemoglobin among free clinic patients. We hypothesize that education, socioeconomic status as a child, social capital, and frequency of visits to the GB clinic will be associated with a decrease in glycated hemoglobin even when controlling for diet, BMI, and initial A1C. In addition, we hypothesize that employment is associated with longer time to glycemic control when controlling for other factors.

## METHODS

Data were obtained via medical records and prospective surveys of diabetic patients seen at the Gary Burnstein Community Health Clinic during the study period and used to calculate sum change of glycated hemoglobin over clinic visits. Bivariate correlations and analysis of variance (ANOVA) informed a multivariate regression model that best predicted time to glycemic control.

## RESULTS

13 of 15 participants showed a negative HbA1c change over time ( $M = -1.83$ ,  $SD = 2.621$ ). While employment ( $N = 14$ ;  $M = 0.714$ ;  $SD = 0.469$ ) is positively correlated with sum HbA1c change ( $N = 14$ ;  $M = -1.94$ ;  $SD = 2.685$ ;  $r = 0.798$ ;  $p < 0.001$ ;  $r^2 = 0.637$ ), no other variables were statistically significant. Nonetheless, the  $R^2$  for the model was 0.866, likely owing to the small sample size, but also indicating high strength among that particular sample.

## CONCLUSION

Given the unexpected direction of the association of employment with both HbA1c and time to glycemic control, safety-net institutions may need to emphasize glycemic control among those whose work-related activity may interfere with behaviors related to glycemic control. Further studies exploring unique barriers to health care for this population should be conducted.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Assessing Attitudes and Behaviors of At-Risk Youth Regarding Intimate Partner Violence: A Pilot Study

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## INTRODUCTION

The CDC identifies multiple risk factors that predispose to the experience or perpetration of violence in intimate relationships. Though many of these risk factors are unchangeable, some modifiable risk factors have emerged as potential targets in decreasing the incidence of teen dating violence, specifically, societal factors such as the acceptance of normalized relational violence and adherence to strict gender norms. This study attempts to address these culturally embedded attitudes that support cycles of violence in an at-risk population of youth in Detroit by providing an emphasis on gender equality and healthy relationships through an educational intervention, using survey tools to track changes in their attitudes and behaviors.

## METHODS

Fifteen participants from the research population completed pre and post educational intervention surveys. In addition to 5 questions about background and demographics, the survey contained 49 questions that assessed agreement with statements and behaviors using a Likert scale. Mean scores for each question were assessed with paired t-tests to quantify change in agreement between pre and post surveys. An alpha level of 0.05 was used to identify significant changes.

## RESULTS

Statistically significant changes were noted in responses to 4 out of 10 statements about gender norms in which agreement on average changed from preference for elevated male societal status to preference for equal status. No statistically significant changes were noted in attitudes towards normalized relational violence or behaviors of violence in intimate relationships.

## CONCLUSION

Our educational intervention tool resulted in significant changes in participants' attitudes towards gender norms from being on average more supportive of male power to being on average more supportive of equal status of sexes. Participants' attitudes and behaviors regarding dating violence were unaffected by the educational intervention, although at baseline, beliefs were disapproving of violence and harassment and reported behaviors indicated at most seldom experiences with or perpetration of dating violence.

# Does Religiosity Mediate the Effects of Lifestyle on Physical and Psychological Health?

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## INTRODUCTION

Religion is integral in the lives of many patients. Previous research has illustrated the role of religion in relation to psychological health and physical health. Looking at a patient as a whole, the relationship between religiosity and ultimate health outcomes are mediated by factors such as stress, BMI, and lifestyle. Previous studies assessed direct relationships between religiosity and psychological health (PsyH) and physical health (PH), but have not examined interplay of mediating factors. The goal of this study is to examine the extent to which the influence of intrinsic religiosity (IR, private beliefs) and extrinsic religiosity (ER, public practices) on PsyH and PH is mediated by the influence of lifestyle, stress, and BMI.

## METHODS

Using an NIH funded dataset (R01DK064284), we identified Lifestyle, ER and IR as latent constructs and created a structural equation model that hypothesized their interactions with stress and BMI using PsyH or PH as endpoints. We assessed direct and “% indirect” effects amongst variables.

## RESULTS

IR has a non-significant direct (-0.045) and 48.86% indirect effect on PsyH. ER has a non-significant direct (-0.003) and 96.1% indirect effect on PsyH. IR has a non-significant direct (-0.040) and 45.95% indirect effect on PH. ER has a non-significant direct (-0.012) and 80.95% indirect effect on PH.

## CONCLUSION

While direct effects were non-significant between religiosity and PH/PsyH, large % indirect effects were noted through significant sequential effects between the variables. From a healthcare perspective, these results are helpful in the pursuit of holistic patient care. We see that intrinsic religiosity may interact with a person's lifestyle and experience of stress to protect against negative PsyH. Encouraging religiosity in patients who suggest that religion plays an important role in their lives is a simple motivational interviewing technique to enrich patients' health.

# **Growing up Outdoors: Using Longitudinal Data from the Add Health Database to Follow Physical Activity Metrics During the Transition into Adulthood**

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## **INTRODUCTION**

Research has consistently shown a short-term positive correlation between proximity to outdoor recreation spaces (e.g., parks) and physical activity in adults. Recently, more research has illustrated a similar correlation in children. This study aims to examine if a link exists between proximity to recreation spaces in childhood and subsequent markers of physical health in adulthood, establishing if the positive changes seen in other research is transient or has lasting effect.

## **METHODS**

This study used data from Waves 1 and 4 of the National Longitudinal Survey of Adolescent to Adult Health (Add Health), to assess the longitudinal health effects of children's access to outdoor recreation spaces. Independent variables were measures of outdoor physical activity and ability to walk to an outdoor recreation area (dichotomous). Socio-economic status was modeled as a control variable. Dependent variables were BMI and resting blood pressure. Confirmatory Factor Analysis (CFA) was performed to validate the latent constructs of the independent variables and Structural Equation Modeling (SEM) was then used to evaluate the relationship between predictor and outcome variables.

## **RESULTS**

The final sample consisted of individuals who responded to all questions, who were not limited by physical mobility issues, had valid census tract information at Wave 1, and provided biomarker samples in Wave IV ( $n = 13,763$ ). CFA results indicated good model fit for all factors. SEM results indicated that there was no statistically significant relationship between access to outdoor recreation areas in childhood and either outcome ( $\beta = .13$ ,  $\chi^2 df 71.26 [29 df]$ ). However, when comparing men and women, access to outdoor recreation areas was a significant predictor of lower BMI for men ( $\beta = 0.24$ ,  $p < .05$ ).

## **CONCLUSION**

The results did not support the hypothesis of improved BMI metrics across study participants with increased exposure. The difference in gender analysis suggests that the effect of outdoor exposure may depend on individual characteristics, a possible area of further exploration.

# Physician Awareness of Patients on the Autism Spectrum

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## INTRODUCTION

Autism spectrum disorder (ASD) is a pervasive developmental disorder that affects 1 in every 68 children in the US. Some patients with ASD require specific accommodations during their interactions with medical professionals. This study aims to assess a physician's awareness about these accommodations and attempts to use this information to bring awareness to the medical community about the importance of the social environment during one's interaction with these patients.

## METHODS

A survey was distributed to the following specialties: Pediatrics, Internal Medicine, Family Medicine, and Emergency Medicine at Beaumont Hospital-Royal Oak Campus. The survey included questions and statements that attempted to evaluate physicians' knowledge about certain needs of patients who have ASD.

## RESULTS

58 responses were collected. With the exception of Internists, physicians from other departments stated that they modify their speaking rates ( $p=0.003$ ) when interacting with patients who have ASD, agreed that patients with ASD are commonly sensitive to loud sounds ( $p=0.002$ ), and agreed that they tend to include more details when performing procedures, compared with other patients ( $p=0.013$ ). Overall, physicians tended to be aware of key concerns commonly brought to light with patients who have ASD. Internists were found to be less aware on some key concerns.

## CONCLUSION

Because ASD is such a complex disorder, more must be done to ensure that physicians are aware of and are accommodating the needs of each individual patient. Awareness of this topic can potentially be brought to light by using the information from this study to construct modules that physicians can complete for CME credits.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Evaluation of the Beaumont Health System Girls on the Run Curriculum

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## INTRODUCTION

Childhood obesity has become increasingly prevalent in the United States. Several programs have been developed to challenge this obesity epidemic and encourage children to live healthier lifestyles, including “Girls on Run” (GOTR), a 10-week YMCA after-school coaching/mentoring program to empower young girls in the areas of physical, social, and emotional health. In 2014, Beaumont Hospitals collaborated with the GOTR YMCA program, which provided training to program coaches by health care personnel on topics coaches would be teaching to girls enrolled in the program. A study of coaches’ knowledge of various topics was conducted to evaluate the effectiveness of this revised training format.

## METHODS

An 11-item knowledge survey was distributed to 124 GOTR coaches at the start of the Beaumont training session and as an online survey at the conclusion of the 10-week GOTR program.

## RESULTS

The pre-training survey was completed by 96 individuals; however complete pre- and post- survey data for coaches who completed the Beaumont GOTR training was 20 individuals. The average pre-training knowledge score for these individuals was 65% (sd=10.7) and the average post-program knowledge score was 70% (sd=11.0). This difference was not statistically significant ( $p=0.06$ ).

## CONCLUSION

Evaluation of the effectiveness of the GOTR training program is limited by the number of coaches who completed both pre- and post- surveys. Despite the small sample size, there is a trend representing a slight increase in pre- and post-survey knowledge scores that approaches statistical significance, indicating that the Beaumont-based training program may help educate coaches on key topics utilized during the GOTR program. Additional research that includes information from a larger number of coaches undergoing training is warranted.

# Improving Parental Attitudes Towards Vaccinations with an Interactive Educational Session: A Pilot Study

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## INTRODUCTION

Recently, parental hesitancy towards vaccinations has grown, leading to increased rates of refusal and use of alternative immunization schedules. Studies have suggested that vaccine safety, perceived risk of disease, and efficacy are among these most commonly parent-reported concerns. This study was designed to examine whether an interactive educational session on childhood vaccinations presented to first-time parents would lead to improvement in parental attitudes towards vaccinations and intention to follow the Advisory Committee on Immunization Practices (ACIP)-recommended schedule.

## METHODS

63 first-time parents involved in the Beaumont Health System Parenting Program participated in a vaccine educational session, which consisted of an educational component on vaccinations, a group discussion, and a question and answer opportunity. Each parent had the opportunity to complete a pre- and post-session survey that assessed parental attitudes towards vaccinating in accordance with the ACIP-recommended immunization schedule. Pre- and post-survey scores were compared using a one-sample t-test analysis to determine overall change in parental hesitancy with participation. Individual hesitancy factors including parental attitudes towards vaccine efficacy and safety were also analyzed.

## RESULTS

A statistically significant reduction in mean survey scores was demonstrated in post-intervention responses compared to pre-intervention responses [mean difference of -2.066 points;  $p < 0.001$ ], corresponding to a decrease in overall vaccine hesitancy. Additionally, parents were less hesitant towards receiving multiple vaccinations simultaneously (decrease in 47% of parents) and vaccine efficacy (decrease in 27% of parents) post-intervention.

## CONCLUSION

The results support the hypothesis that participation in an interactive vaccine educational session decreases parental hesitancy towards immunizations. Particularly, this intervention may influence attitudes towards vaccine safety, efficacy, and the ACIP-recommended schedule and increase immunization rates. These sessions can be easily implementable in various settings and should be studied further to determine the long-term effect on vaccination rates.

*Recipient of the Nicholson Capstone Competitive Scholarship Award.*

# Effects of Smoking on Progression of Specific Functional System Disability in Multiple Sclerosis Patients

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## INTRODUCTION

While a definitive etiology of multiple sclerosis (MS) remains unknown, the prevailing consensus is that MS is an autoimmune disorder, the progression and onset of which depend on multiple genetic and environmental factors. Recent data on disability in MS has demonstrated an increased risk of progression associated with cigarette smoking. This study aims to corroborate and elaborate on existing research by examining the progression of disability in ever-smokers, examining more closely which specific functional systems are being affected most.

## METHODS

This retrospective cohort study examined 150 MS patients based on progression of disease-associated disability over 1 year, comparing ever-smokers to never-smokers. Data was collected from the charts of MS patients seen at the offices of the Michigan Institute for Neurological Disorders in southeastern Michigan. Two Expanded Disability Status Scale (EDSS) scores were determined for each patient: one at the most recent visit within a month of data collection, and one 12 months prior. It was also determined which functional system progressed in disability most over this period. Functional systems examined include: pyramidal, cerebellar, brainstem, sensory, bowel and bladder, visual, cerebral, and other.

## RESULTS

When MS patients who smoked were compared to never-smokers, an association was found with respect to effect on functional system progression categories (Chi-square P-value = 0.001). Specifically, higher rates of pyramidal system progression were found in ever-smokers (54%) than in never-smokers (31%). There were also found to be higher rates of no progression in never-smokers (27%) than in ever-smokers (8%).

## CONCLUSION

The results expand on existing knowledge of MS disability progression in ever-smokers, demonstrating an association between higher rates of disability progression in specifically the pyramidal functional system. The implications of this finding may potentially lead to more insights about the specific role and mechanism cigarette smoke exposure plays in the progression of MS.

# Why do Patients Delay Seeking Treatment for Non-Melanoma Skin Cancer?

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<sup>4</sup>Department of Dermatology, Henry Ford Hospital

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## INTRODUCTION

Non-melanoma skin cancer (NMSC) is diagnosed over 3 million times yearly in the United States making it the most common type of cancer diagnosis. We explored why patients delay seeking treatment for NMSC. Published literature has focused on delays associated with melanoma and to a lesser extent NMSC in commercially insured patients in the private practice setting. We sought to contribute to the literature by surveying an urban tertiary-care hospital treating patients with varied insurance coverage.

## METHODS

700 adult patients diagnosed with NMSC were recruited through Henry Ford Hospital electronic medical record. Patients were informed of the study via mail and contacted via phone to complete an optional 24-question survey pertaining to their experience with NMSC. The survey explored the timeline of their symptoms and when they sought a diagnosis. Reasons for delay such as denial, fear, financial hardship etc. were recorded. Anatomic and demographic data were also collected. The data was analyzed to determine if patients significantly delay seeking diagnosis after realizing they have a lesion and sought to determine factors correlating with delay.

## RESULTS

116 participants completed our survey. There was a 90-day median delay in seeking diagnosis, ranging 1-7500 days. There was a 14-day median delay in getting an appointment with their physician, ranging 1-180 days. 50% of respondents attributed their delay to thinking the lesion would go away on its own and thinking the lesion wasn't important. 17% of respondents identified a major life problem during the time that they noticed their skin lesion.

## CONCLUSION

This study identified that delay was frequently attributed to denial, which aligns with previously published literature. Through further analysis we hope to determine other correlations with delay in seeking treatment. Targeting barriers to seeking diagnosis may allow for earlier treatment and possibility decrease morbidity and mortality from NMSC.

*Recipient of the Dean's Choice Capstone Oral Presentation Award.*

# Financial Analysis of Outpatient Surgery Based on Payment Model

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## INTRODUCTION

A payment model that is rising in popularity is a proactive, “cash only” self-payment model; similar models are known as retainer, boutique, or concierge models. A more general term to describe all of these models is defined by the American College of Physicians (ACP) as direct patient contracting practices (DPCPs). The ACP states that studies of the DPCP models are “limited.” The goal of this project is to answer two main research questions that will add to this area of limited research. Does cost to the patient vary by payment model? Does the profit margin vary by payment model?

## METHODS

Beaumont Health Systems provided the financial data for fiscal year 2013 through the EPSI Decision Support System for Beaumont facilities. Also, data was received from an in-house financial database from the Surgery Center of Oklahoma. Five commonly performed outpatient surgeries were analyzed. All data was analyzed and graphed using Microsoft Excel. The Excel document with raw data and analysis are provided in the appendices. The total volume of surgical cases analyzed was 2,925.

## RESULTS

Traditional payment models revenues range from 33-51% of average total charges. Retroactive self-payment models revenues range from 12-21% (n=2,925). The retroactive self-payment model returned less revenue than expected due to non-payment. Retroactive self-payment models charge 2.16 times more than the proactive self-payment model and 1.97 times more than insurance reimburses. With the self-payment discount, this model still charges 1.29 times more than proactive self-payment models. (n=2,379). All surgeries except for shoulder arthroscopy/surgery generate a loss for the facilities. (n=2,847). All facilities except for the Children’s Center for Surgery take a loss on every outpatient procedure. (n=2,379).

## CONCLUSION

Retroactive self-payment models charge the most, and the facility takes the largest loss. DPCP models show promise in reducing cost to the patient while providing a viable business model for providers.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

*Recipient of the Dean’s Choice Capstone Oral Presentation Award*

# **Efficacy of Outreach to Individuals Based on Prior HIV Testing and Counseling in Seeking Further Preventative Information**

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## **INTRODUCTION**

Advances in HIV pharmacological therapy have prolonged quality and length of life. However, prevention still remains key in curbing the epidemic. A primary tenet of prevention is knowledge of HIV and knowing one's own status. Our project aims to assess how individuals obtain HIV information and testing services to better inform how resources for prevention can be effectively allocated.

## **METHODS**

Flyers were placed in a general information area and a HIV testing area in two clinics, Affirmations, Ferndale, and American Indian Health & Family Services, Detroit. The flyers contained different web addresses based on their location in the clinic, directing individuals to the same web module containing information about HIV and a survey querying prior testing history, risk assessment and demographic factors. A link was provided from the web module to a website where testing resources were available. Web traffic was monitored to ascertain the initiative individuals were taking in seeking further information. A qualitative analysis of a focus group of 17 people was done consisting of college-aged adults interested in the medical field to gain perspective on how individuals obtain HIV information.

## **RESULTS**

The study duration was 16 months. Clicks to the flyer links were minimal, not increasing substantially over the duration. However, clicks to the freely searchable website received consistent monthly traffic of about 8 clicks/month. The focus group elucidated central themes of faith in healthcare providers to direct individuals for testing, an unlikeliness to interact with paper media, and the importance of direct human contact in seeking HIV prevention resources and testing.

## **CONCLUSION**

Data from the web-based design and focus group analysis indicates that a directed approach involving healthcare providers, peers, etc. is most effective in encouraging prevention-seeking behavior when people are seeking specific information due to immediate need, but that web-based information is useful when general knowledge is sought.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# The Effect of Housing on Overuse of the Emergency Department

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## INTRODUCTION

It is commonly thought that homeless patients utilize the Emergency Department (ED) for non-emergency services and more frequently than the general population. This project examines over-use of the ED with a focus on non-emergency use of the ED by homeless patients.

## METHODS

Data from the 2007-2010 National Hospital Ambulatory Medical Care Survey Emergency Department Records provided nationally representative snapshots of emergency department visits. ICD-9 codes were re-coded into a binary variable consisting of "Valid" emergent codes or "Invalid" non-emergent codes based on a collection of ED auto-pay codes. Using the "Patient Residence" variable, homeless and housed visits were compared for the variables "Seen in ED within the last 72 hours," "Discharged from any hospital within the last 7 days," "How many times has patient been in this ED within the last 12 months," and our "Valid/Invalid" variable. Housed Medicaid patients were used as a control for poverty. SPSS was used for statistical analysis.

## RESULTS

Significant differences were seen between homeless visits and both the general housed and housed Medicaid visits. When compared to the two other groups, homeless patients are significantly more likely to have visited an ED within the last 72 hours, significantly more likely to have been discharged from a hospital within the last 7 days, and have more ED visits per year. There is no statistically significant difference between homeless visits and housed Medicaid visits with regard our "Valid/Invalid" variable, but homeless visits are significantly more likely to be "invalid" when compared to general housed visits.

## CONCLUSION

This data suggests that the burdens of poverty, such as lack of community resources, are driving homeless ED use. Our results reveal possible ways to better serve homeless patients in a more dignified and accessible manner (i.e.- substance abuse services) while conversely minimizing the cost-ineffective reliance on Emergency Departments.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Awareness, Knowledge, and Behavior Regarding HIV/AIDS Among Freshman Students at Oakland University

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## INTRODUCTION

Human immunodeficiency virus (HIV) causes a sexually transmitted disease affecting the human immune system that eventually leads to acquired immunodeficiency syndrome (AIDS). HIV is mainly transmitted through sexual intercourse, blood transfusions, hypodermic needles, and from mother to child. Multiple actions can be used to prevent the spread of HIV/AIDS, such as condom use, using sterile needles, and HIV testing for pregnant women. This study aims to assess freshman students' knowledge, attitudes, and behavioral perceptions regarding HIV/AIDS at Oakland University (OU) in Michigan. Factors associated with hindrance to prevent the spread of HIV include inadequate knowledge, negative attitudes, and risky behaviors. The incidence of HIV is highest in young adolescents under the age of 25, and 81% of youths who were diagnosed with HIV were between the ages of 20 and 24.

## METHODS

This study is a cross-sectional survey targeting freshman students at OU. The questionnaire includes seven sections that ask about demographics, risk perception, protection measures, alcohol tendencies, health seeking behaviors, gender, culturally sensitive issues, and potential dissemination of information.

## RESULTS

The mean age of the respondents was 20. The majority of the respondents knew that HIV is transmitted sexually (98%) and by sharing needles (98%). Misconceptions about transmission of HIV were believed by 53%. Even though 70% of the students listed condoms as a preventive method for HIV contraction, only 54% reported using this method. While 67% of the participants revealed that they were sexually active, only 19% of the participants have been tested for HIV in the past two years.

## CONCLUSION

This study showed that while there was good knowledge regarding ways of HIV transmissions and methods of prevention, some misconceptions still prevailed. Our results indicate the need to develop educational programs with specific interventions to raise awareness about preventive measures, clear misconceptions, and promote healthy sexual behaviors in order to prevent new HIV infections among young college students.

# Behavioral Perceptions of Oakland University Female College Students towards Human Papillomavirus Vaccination

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## INTRODUCTION

Human Papillomavirus (HPV) vaccination decreases the risk for cervical cancer. However, the uptake of HPV vaccine remains low when compared with other recommended vaccines. This study evaluates the knowledge and attitudes towards HPV infection and vaccination, and the readiness for the uptake of HPV vaccine amongst female students attending Oakland University (OU) in Michigan, United States.

## METHODS

This is a cross-sectional study targeting a randomized sample of 1000 female OU students using an online questionnaire. The data was statistically analyzed using SPSS software. A total of 192 female students with the mean age of 24 completed the survey.

## RESULTS

The majority of participants had previous sexual experience with occasional contraception use (78.1%), were non-smokers (92.7%), and non-alcohol drinkers (54.2%). The participants had a mean knowledge score of 53.0% with a standard error 2.3% translating to a moderately informed population. The majority agreed that HPV is life threatening (79%), the vaccine prevents cervical cancer (62%), and that side effects would not deter them from vaccination (63%). Although two thirds (67%) believed that based on sexual practices in the United States, female college students in Michigan have a higher chance of contracting HPV, about 50% did not believe they themselves were at risk. Higher knowledge correlated with increased recommendation for the vaccine (correlation-factor 0.20,  $p = 0.005$ ).

## CONCLUSION

Results suggested that the best predictor for improvement of vaccination was awareness level and disease education. This indicates a need for an educational intervention to raise awareness, increase HPV vaccine uptake, and decrease the incidence of cervical cancer.

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*Recipient of the Nicholson Capstone Competitive Scholarship Award.*

*Embark Capstone Colloquium Speaker.*

# The Benefit of Adding a Quick-Look Echocardiogram to the High School Preparticipation Cardiovascular Screen

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## INTRODUCTION

Current recommendations for preparticipation cardiovascular screenings of high school athletes do not include the use of 12-lead ECG or echocardiography. Quick-look echocardiograms are hand held devices that are faster and less expensive to use than traditional echocardiogram machines. This study examines the usefulness of quick-look echocardiograms as a component of preparticipation heart screenings to find abnormalities not detected through physical exam, history, or ECG.

## METHODS

The study population included 1563 high school aged participants from the Beaumont Healthy Heart Check program. Each participant was evaluated using a physical exam, medical history, 12-lead ECG, and quick-look echocardiogram. Individuals received a recommendation to continue physical activity, continue activity with a physician follow up, or stop activity with a physician follow up. 204 individuals received recommendations to follow up with a physician based on abnormalities found during screening. The results from these screenings were evaluated using Chi-square tests of independence to evaluate whether abnormalities in the history and physical were correlated with the results of more advanced testing.

## RESULTS

Individuals with abnormal quick-look echocardiograms were more likely to have a normal history and physical,  $X^2(1, N=204) = 42.551, p < .001$ . Further, individuals with abnormal 12-lead ECG results were more likely to have a normal history and physical,  $X^2(1, N=204) = 44.85, p < .001$ . There was no correlation between quick-look echocardiogram results and 12-lead ECG results,  $X^2(1, N=204) = .725, p = 0.394$ .

## CONCLUSION

The addition of a quick look echocardiogram to the high school preparticipation cardiovascular screen identified significant abnormalities in individuals with a normal medical history and physical exam.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet)*

# Impact of Parenting Programs on Stress and Mental Well-Being among Latino Parents

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## INTRODUCTION

Parenting can be demanding, and cultural values regarding raising children can contribute to parental stress and have an impact on parental mental health. Studies have shown that Hispanic, Asian, and black mothers reportedly experience more parenting stress compared to white mothers. The purpose of this study is to determine if and how culturally sensitive parenting programs facilitated through Hispanic Outreach Services-Catholic Charities of Southeast Michigan affect parenting stress and mental well-being of Hispanic parents.

## METHODS

This study includes a convenience sample of sixteen subjects who meet the following criteria: (1) a Latino parent between the ages 18-65, (2) who belongs to Hispanic Outreach Services-Catholic Charities of Southeast Michigan and (3) who participates in the 10-week parenting program offered through Hispanic Outreach Services. Pre- and post-test surveys — Parenting Stress Scale, BDI-II (Beck Depression Inventory-II), and STAI (State-Trait Anxiety Inventory) — assess for the level of parenting stress and mental well-being. A paired t-test analysis will analyze the impact of the 10-week parenting program on parental stress and mental well-being.

## RESULTS

Nine of the original sixteen participants were present for the posttest surveys. All survey scores decreased over the span of 10 weeks, with significant score reduction seen with the Parenting Stress Scale  $t(5) = 3.152, p = .025$ , BDI-II  $t(5) = 5.463, p = .003$ , and STAI-Y2  $t(6) = 3.953, p = .008$ .

## CONCLUSION

The results correlate with reduced parental stress levels and improved overall mental well-being in the Latino community. This data aids in the efforts to encourage health care providers to refer Hispanic parents to this program in order to receive social support and improved mental health outcomes.

# **Factors Resulting in Overuse of the Emergency Department by the Homeless A Qualitative Study**

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## **INTRODUCTION**

This is a qualitative study determining the factors associated with homeless overuse of the Emergency Department (ED). While ED overuse by homeless individuals has received some attention in the literature, little work has been done to elaborate the narratives of homeless ED users themselves. This project explores the nature of ED use and its associated factors from the perspective of homeless patients. In particular, homeless individuals were interviewed in depth about obstacles in health care, shelter support provided, and experiences in the ED.

## **METHODS**

The participants in this study are homeless individuals who utilize HOPE Warming and Hospitality Center. Narrative data was collected using semi-structured interviews. Data analysis adopted analytic strategies common to grounded theory, allowing themes to emerge through a coding and conceptualization process informed by “constant comparison.”

## **RESULTS**

Data reveal that the ED lacks a discharge approach that accounts for the homeless and their poor access to health care and support once discharged. In particular, homeless patients often are discharged to the street or to facilities not equipped to provide medical supervision or management. Improved health and sobriety for the homeless were associated with the stability offered by the shelter HOPE.

## **CONCLUSION**

Lack of referral after discharge to such supportive programs at shelters may contribute to ED recidivism and overuse. Perhaps most promising, respite shelters which specialize in medical management for discharged homeless patients offer appropriate continuation of care. Unfortunately, even where these services exist, they are not always well utilized by the hospital. Future research should examine how a discharge protocol tailored for the homeless affects ED return rates.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# **Assessing and Correcting Myths and Misconceptions regarding Reproductive Health in Urban Adolescents**

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## **INTRODUCTION**

Attitudes towards sexual health knowledge are a major social determinant of health and well being in “at risk youth.” The assumption was that youth at high-risk for unintended pregnancy lack appropriate education on sexual and reproductive health and obtain their knowledge from myths and rumors they hear at school, at home, in magazines, or on the streets. This study aimed to assess baseline knowledge of reproductive health and re-assessed knowledge after an educational module on this topic at Downtown Youth Boxing, an after-school academic and physical activity program for socioeconomically disadvantaged urban youth in Detroit.

## **METHODS**

Adolescents ages 13-21 were given a paper-based questionnaire to assess their current level of knowledge regarding reproductive health. It included questions on contraception types, sexually transmitted infections, and other ways of pregnancy prevention. An educational intervention was then given to provide accurate information in hopes of displacing any inaccurate assumptions and changing attitudes to reflect healthy and safe practices. The success of the intervention was tested in a post-intervention questionnaire completed approximately 3 months later.

## **RESULTS**

Fifteen students, ages 13-21, 67% male and 33% female, filled out both pre-intervention and post-intervention surveys. 47% of students reported no sex education class in school. Significant changes post-intervention included students disagreeing to “If a girl suggested using condoms to her partner, it would mean that she didn’t trust him.” Knowledge of types of contraception and sexually transmitted diseases increased post-intervention, but did not reach statistical significance.

## **CONCLUSION**

Based on pre-intervention and post-intervention survey findings, there was an increase in reproductive health knowledge. It is hoped that the students of Downtown Youth Boxing will pass on their new knowledge to classmates outside of this program.

# **Easing the Transition: A Program for College-bound Teens with Diabetes**

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## **INTRODUCTION**

For patients with diabetes, adolescence and young adulthood can be very challenging. The transition from pediatric care to an adult provider occurs during this period, often creating difficulties navigating the health care system and loss to clinical follow-up, leaving patients vulnerable to poorer metabolic control. This transition is further complicated when young adults begin attending college in a new environment. This study aimed to evaluate the effectiveness of a one-time pre-college education program at improving knowledge, self-care skills, and glycemic control in graduating high school seniors with type 1 diabetes.

## **METHODS**

60 high school seniors with type 1 diabetes were invited to attend. The program consisted of a lecture followed by a discussion featuring a panel of college students with type 1 diabetes. Educational curriculum was adapted from the American Association of Diabetes Educators' 7 Self-Care Behaviors. Participants completed a pre-class quiz, an immediate post-class quiz, and a 1-year follow-up quiz. Of the 60 students invited, 12 attended the program and 7 completed the follow-up quiz at 1 year and were enrolled in the study.

## **RESULTS**

There was a significant improvement in mean quiz score after attending the program ( $P=0.0113$ ), with an average improvement in score of  $2.14\pm 1.57$  points (maximum score of 20 points). Significant improvement in mean quiz score was maintained at one year ( $P=0.0353$ ), with an average improvement in score of  $1.43\pm 1.40$  points. There was no significant change in HbA1c values between baseline and one-year follow-up.

## **CONCLUSION**

A one-time education program offered to graduating high school seniors appears to improve short- and long-term knowledge of diabetes self-care. Glycemic control was not significantly altered; however, further investigation utilizing a control group would help to better elucidate the impact of the program.

*Recipient of the Dean's Choice Capstone Oral Presentation Award*

# Assessing the Need for Autism Spectrum Disorder Physician Education

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## INTRODUCTION

Autism Spectrum Disorder (ASD), a lifelong developmental disorder characterized by impaired social interaction and difficulty communicating, can lead to challenges accessing health care. It has recently been estimated by the CDC that approximately one in 68 children have been identified with ASD. Considering the prevalence in the population, physicians treating young adults will eventually see patients with ASD. Therefore, this study aims to identify modifications that physicians could make to improve the clinical experience for young adult patients with ASD.

## METHODS

Young adults (ages 18-30) diagnosed with ASD enrolled in Oakland University Center for Autism and their parents/caregivers were asked to complete a survey addressing medical care experiences. Results were analyzed for frequency trends.

## RESULTS

Six young adults (age 18-23) with ASD and 23 parents/caregivers completed the survey. 91% (21/23) of parents/caregivers routinely help their young adult with ASD with health needs. 61% (17/23) felt there was not immediate understanding by the medical personnel that their young adult has specific needs during their visit. 74% (17/23) of parents/caregivers believe increased education of medical students, medical school faculty, and physicians on the specific needs of individuals on the spectrum would improve health care delivery. Of the young adults surveyed, 84% feel they are treated with respect and understanding at the hospital or clinic. However, it is clear they have specific health care needs, as 83% (5/6) reported wanting specific instructions from medical staff during their visits, 83% (5/6) need help with forms, and 50% (3/3) prefer an explanation before examinations/tests are performed.

## CONCLUSION

Although a limited number of surveys were returned, the responses verify that young adults with ASD and their parents/caregivers encounter challenges when accessing health care. Future studies targeting the implementation of an ASD centered educational program for medical students and physicians may address some of these needs.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*



# HEALTH SYSTEMS RESEARCH ABSTRACTS

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# Potential Impact of Rapid Diagnostics in Management of Suspected Pneumonia

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## INTRODUCTION

Bacterial cultures for pathogen identification and resistance testing can take days during which patients may receive unnecessary or inappropriate antibiotics. The Curetis AG Unyvero™ System is a rapid molecular diagnostics platform which recently completed a clinical trial for patients with suspected pneumonia. We hypothesized that using such a system in a clinical setting could improve outcomes, decrease lengths of stay, and handle the throughput of a large clinical microbiology lab.

## METHODS

A retrospective chart review was performed for adult patients with culture data available from endotracheal aspirates or bronchoalveolar lavages during the peak pneumonia season of 2013. Clinical and demographic data was analyzed for appropriateness of antibiotic treatments based on culture results to predict potential benefits of the Unyvero System. Data on cultures received per shift was reviewed to determine the system size needed to cover the requirements of a hospital system with 1840 beds.

## RESULTS

The study population included 395 unique patients (499 samples) obtained from January-March 2013 at Beaumont Health. The average time for culture results was 2.7 days, 63% of patients were overtreated, 22% were undertreated, and 15% were receiving an appropriate antibiotic regimen. Eighteen patients were undertreated and expired without being in hospice care, 7 (38.9%) of these were classified as having potentially modifiable antibiotic courses. A basic system consisting of one lysator and 2 analyzers could handle peak loads most days of the pneumonia season.

## CONCLUSION

When managing patients with suspected pneumonia, the Unyvero System has the potential to decrease the time to optimization of antibiotic treatment from days to hours. Theoretically most patients who are intubated or undergo lavage could have shorter stays and improved outcomes if a rapid diagnostics system is utilized. The system itself in a minimal configuration can handle the throughput of a large clinical microbiology lab.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

*Recipient of the Nicolson Capstone Competitive Scholarship Award.*

# Improving Patient Satisfaction and Engagement with the Electronic Health Record System myBeaumontChart

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## INTRODUCTION

Electronic health record (EHR) technology was created over a decade ago and there has been a slow but continuously rising implementation rate throughout the years in health systems across the world. Even with many of the proposed benefits of the EHR system becoming realized, many unforeseen consequences and concerns about the system have arisen, especially in regards to usability and privacy. The goal of this study is to identify patient's views on their use of the current myBeaumontChart EHR and identify areas of improvement in order to increase patient engagement and satisfaction.

## METHODS

A prospective study of patient satisfaction and engagement with the electronic health record system at Beaumont (myBeaumontChart) assessed outcomes using a one-time survey. A list of 3000 randomized patient email addresses of those enrolled in the system was generated, with the return of 300 subjects enrolled. Categories of users were compared using a two-sample t-test or a chi-square test. Results were considered significant at  $p < 0.05$ .

## RESULTS

Descriptive statistical analyses revealed the vast majority of subjects (N=236) were satisfied and demonstrated several significant findings: Frequent users were more likely to have access to more features on myBeaumontChart and utilize more of the available features than non-frequent users. Satisfied myBeaumontChart users were more likely to have access to requesting medication refills, viewing immunizations, viewing lab and radiology results, and viewing treatment received. Users who self-identified as non-satisfied were most likely to report dissatisfaction with the amount of time it took to receive results, but the study found no significant change in satisfaction if they received results faster.

## CONCLUSION

Overall, current myBeaumontChart users are satisfied with the system. The EHR system is being utilized and making patients more engaged in their healthcare. However, this study identified minor changes, such as increasing access to specific features, which could possibly increase frequency of use and improve patient satisfaction with the current EHR.

# Relevance of Prescription Assistance Programs

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## INTRODUCTION

Cost can be a major barrier toward medication compliance. Prescription Assistance Programs (PAPs) are offered by pharmaceutical manufacturers to provide medications to low-income individuals at more affordable prices. NeedyMeds, a national non-profit resource, is one of multiple organizations that help connect patients to PAPs. With more people covered by insurance following the implementation of the Affordable Care Act (ACA) in 2014, this study examines whether PAPs are still relevant.

## METHODS

Retrospective data obtained through NeedyMeds, was used to assess PAP use from 2009 to 2016. Linear regression analysis was used to analyze trends in the number of orders placed and total prescription savings per year following the implementation of the ACA. Since data was only available through September of 2016, the data was extrapolated to provide an estimate for the remaining three months. A two-sample independent t-test was used to analyze total savings per patient during the three years prior to and following the implementation of ACA.

## RESULTS

There was a significant downward trend in the number of orders placed per year between 2014 and 2016 ( $p$ -value =  $< 0.001$ ). There was also a significant decrease in the total prescription savings per year between 2014 and 2016 ( $p$ -value =  $< 0.0001$ ). The average savings per patient during the three years prior to the major ACA implementations (2011-2013) was \$3,722.14 and during the three years following (2014-2016) was \$3,323.54, in which there was no significant difference ( $p$ -value = 0.3746).

## CONCLUSION

There was a significant decline in PAP use following ACA implementation in 2014. However, those who were eligible were still able to save a significant amount of money. This data can help incentivize healthcare workers to bridge the gap between patients and PAPs, especially among underrepresented populations. Changes in healthcare policy may affect the relevance of PAPs in the future.

# Follow-Up Phone Calls in the Pediatric Emergency Department: Patient Satisfaction and Revisit Rate

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## INTRODUCTION

With more emphasis on reducing revisit rates (RR) and increasing patient satisfaction after changes to our healthcare model, hospitals have proposed interventions aimed at improving both. The Pediatric Emergency Department (ED) at Beaumont Health conducts follow-up phone calls within 72 hours of discharge. The goal of this study is to determine if this intervention has any effect on 72-hour RR or patient satisfaction.

## METHODS

From June to December 2015, nurses conducted follow-up phone calls and documented whether they talked to the patient/caregiver (communication), left a voice message, or there was no answer. This data was used to formulate monthly number of calls and what type of communication occurred. Press-Ganey questionnaire data was analyzed for each month, with emphasis on 5 questions, and 72-hour RR was collected. Spearman Rank correlation test was used to determine if there was any correlation between type of communication and RR or patient satisfaction.

## RESULTS

Of the 4,408 follow-up phone calls, 39.7% (1,752) had communication, 34.2% (1,506) a voice message was left, and 26.1% (1,150) had no communication. There was no significant increase in patient satisfaction scores regardless of type of communication; patients/caregivers reached, had a voice message left, or had no communication ( $p$ -value = 0.1802; 0.1482; 0.1194 respectively). There was no significant association between the 72-hour RR and the percent of patients who had communication ( $p$ -value = 0.0522). There was an association between 72-hour RR and how many patients had a voice message left or had no communication ( $p$ -value= 0.0234; 0.0137 respectively).

## CONCLUSION

The results suggest that while follow-up phone calls may not significantly increase patient satisfaction, there is an association between this intervention and RR. Moreover, it appears that some type of communication, even if it is a voice message, could be beneficial to help reduce revisits to an already overcrowded ED.

# Assessing the Impact of Culture of Safety on Patient Safety Events

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## INTRODUCTION

Most hospitals record unit-specific Culture of Safety (COS) scores and monitor Serious Safety Events (SSEs), yet there has not been significant analysis that correlates COS scores with incidence of SSEs. Establishing this correlation could provide a new opportunity for system-wide quality improvement. This study analyzes Troy Beaumont's SSEs from 2012-2014 and assesses the impact of COS scores on SSEs during that same time period.

## METHODS

50 SSEs that occurred at Beaumont Troy Hospital between 2012 and 2014 were analyzed based on system and human errors using the Healthcare Performance International (HPI) taxonomy. Simultaneously, the Agency for Healthcare Research & Quality (AHRQ) COS scores were organized and trended by service area. COS scores were considered high or low based on the AHRQ national benchmark. Data analysis determined if a correlation existed between COS scores and incidence of SSEs within each service area.

## RESULTS

First, HPI analysis of the SSEs showed that 50% of SSEs occurred within Care Management. Of the system failures that led to the SSEs, HPI analysis showed that 53% included a component of patient safety cultural breakdown. Moreover, 6 Troy departments had  $\geq 3$  SSEs occur. Of these, 4 departments were predominantly involved in direct patient care and had a mean COS score below the national average around the time a given event occurred. Two departments, which were more heavily involved in diagnostics and imaging, had COS scores that were significantly above average.

## CONCLUSION

Current data does not show a statistically significant correlation between departmental COS scores and the incidence of SSEs. However, HPI analysis of each specific SSE showed that a majority of them were driven by a breakdown that included a culture component. Thus, we do see evidence to continue monitoring COS scores, SSE incidence, and SSE re-categorization based on the HPI analysis system on a longitudinal basis.

# **Pediatric Emergency Imaging Turnaround Times Between Different Interpretation Methods**

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## **INTRODUCTION**

Improving care by decreasing turnaround time (TAT) of radiological imaging results from the pediatric emergency department (ED) has been a recent area of interest at Beaumont Health. Of roughly 120,000 emergency visits annually, nearly 25% are pediatric emergency visits. The objective of this study is to determine whether TAT can be decreased by 1) placing radiologists in reading rooms directly in the ED or 2) radiologists remain in their department but focus only on imaging requests from the pediatric ED.

## **METHODS**

Data on TAT was collected retrospectively from 2013 and 2014 via EPIC (Electronic Health Records). In the first modality the radiologist was relocated to interpret images directly in the ED for 8 days in November of 2013. In the second modality a radiologist, for 4 days in November 2014, remained in the radiology reading room and was designated to focus only on pediatric ED imaging requests. With the exclusion of these testing dates, images processed in 2013 and 2014 serve as control data with a sample size of 17060 and 17221 respectively. Imaging requests that took greater than 6 hours or were incomplete were considered outliers and excluded.

## **RESULTS**

Data from 2013 shows that placing radiologists and residents in the ED led to a 20% decrease in TAT for CT scans (n=8) and a 9.5% decrease in TAT for general imaging (n=264) requests. Data from 2014 shows that dedicating a radiologist from the radiology department to focus solely on cases from the pediatric ED led to a 38.2% decrease in TAT for consults (n=6) and a 10.3% decrease in ultrasound imaging (n=30) requests.

## **CONCLUSION**

The implemented strategies decreased TAT for some imaging modalities. Further research and greater samples sizes will be necessary to further investigate successful methods for decreasing TAT's while not sacrificing resident training opportunities.

# MEDICAL EDUCATION RESEARCH ABSTRACTS

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# Developing and Assessing Embryology Web Resources

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## INTRODUCTION

Understanding human embryology can be challenging. It has been reported that the use of multimedia increases comprehension and retention of this four-dimensional subject; however, few comprehensive human embryology websites exist. Searching for useful resources (i.e., videos, interactive activities) is time-consuming and their effectiveness has not been evaluated. Our goal is to assemble embryological educational materials in a single module for each M1/M2 embryology session and evaluate their effectiveness.

## METHODS

Each module was designed to present key concepts, related videos and animations, clinically relevant congenital disorders, a glossary of terms, interactive activities, and short assessment. Before using the modules, M1 students completed a pre-survey to determine their understanding of embryology, number of related courses taken previously, resources used and time spent studying the topic prior to medical school. A similar survey will be administered at the end of their M2 year to determine how they now rate their understanding, what their study habits were during M1/M2 years, and how useful they found the modules.

## RESULTS

More than half the pre-survey respondents reported prior related courses, however, ~70% rated themselves as “not at all” or only “slightly” knowledgeable. Most felt their study time would be used for lecture review and not on reading assignments. Most respondents were likely to use online resources to study. The majority of students have taken advantage of the modules. Quiz scores (averaged 6/10) suggesting students used the assessments within the modules without studying the modules. Initially, students used the modules with multiple quiz attempts. As time passed, while students continued to use the modules, fewer attempts were made. Post-surveys will be administered this semester when M2 students complete all sessions.

## CONCLUSION

Analysis of post-surveys is needed to determine whether the time spent on modules influenced student performance or study habits, and the students’ opinions of module utility and effectiveness.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Validation of the Oakland University William Beaumont School of Medicine Holistic Admissions Process

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## INTRODUCTION

Medical schools receive far more applications than the number of students they can accept, and consequently, admissions committees must ensure that they are selecting those individuals who are most likely to thrive and succeed in medicine. Studies have shown that pre-admission GPA is the best indicator of academic performance in medical school, but less research has been successful in determining selection factors predictive of clinical performance. Additionally, as many medical schools look for a more holistic approach to selecting candidates, the admissions interview is receiving increased attention. Our study aims to determine if there is a correlation between interview scores and academic and clinical success of the matriculating medical candidates. This study will aid in validating the holistic approach taken by the Oakland University William Beaumont School of Medicine in selecting their candidates.

## METHODS

125 OUWB medical students from the first and second classes were used to compare matriculating student interview scores (subcategory and overall score) with both OSCE score (determinant of clinical success) and USMLE Step 1 score (determinant of academic success). The data was collected in a retrospective manner for non-experimental correlational analysis.

## RESULTS

Overall interview score was found to positively correlate with OSCE score  $p=0.00545$  but not with USMLE Step 1 score  $p=0.98811$ .

## CONCLUSION

The results support the hypothesis that interview scores are predictive of clinical performance in medical school and thus should continue to play an important role in the selection of candidates for matriculation.

# **Development of a Pre-clinical Elective for Medical Students at a Residential Diabetes Camp**

**Julia Orlovskaja<sup>1</sup>, Richard L. Sabina, Ph.D.<sup>2</sup>, Bernard M. Degnan, M.D.<sup>3</sup>**

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## **INTRODUCTION**

Chronic illness, such as Type 1 diabetes, is widespread in culture, yet frequently difficult to understand in strictly an academic setting. A residential, overnight diabetes camp has been used as a clinical learning ground for nursing and pharmacy students, but currently no documentation exists for medical students in their pre-clinical years. A pre-camp curriculum was established and assessed for effectiveness in educating and training medical students in the field of type 1 diabetes treatment and management.

## **METHODS**

The study was designed to enhance a pre-clinical elective rotation curriculum for medical students at Oakland University William Beaumont (OUWB) School of Medicine. The study design is a pre-post test design with a non-randomized control and experimental group. The control group included two, third year medical students from OUWB and Wayne State who did not partake in the curriculum. Four knowledge based tests were administered to the participants: prior to online module completion, prior to live interactive session completion, after live interactive session completion, and three months after the end of camp. Due to the small number of participants, data collection and analysis in the pilot study focused on qualitative data from trend changes of the knowledge based tests, surveys, and short answer questionnaires.

## **RESULTS**

First year medical students showed increased knowledge and perceived greater confidence in skills following the curriculum and camp experience. The first year medical students expressed feeling overwhelmed at camp, but highly recommended the curriculum to future students in preparing for the responsibilities at diabetes camp.

## **CONCLUSION**

Preliminary results suggest that the curriculum can increase knowledge of treatment and management of type 1 diabetes for medical student participants. Suggestions were collected to improve the curriculum and a revised curriculum was created to be implemented to a larger cohort to increase power for future statistical analysis.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# Content Evaluation of a Neuroscience Course in an Integrated System-Based Curriculum

Valerie O. Osula<sup>1</sup>, Gustavo Patino, M.D., Ph.D.<sup>2</sup>, Misa Mi, Ph.D.<sup>3</sup>,  
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## INTRODUCTION

Basic medical education in the USA must prepare students for two tasks: performing well in clerkships and taking the United States Medical Licensing Examination (USMLE) Step 1. Ideally, both objectives would be in perfect alignment, with content and resources shared by both. In reality, there is agreement that this alignment is not perfect; but an objective description of the difference has not been systematically carried out for specific disciplines. The objective of the current study is to quantify the content differences between a Neuroscience organ system course at our institution and the USMLE Step 1, with respect to the coverage of content deemed critical to adequately prepare students for their clerkships.

## METHODS

Based on curriculum design theory a Master List of basic science content was chosen as the tool to carry out such quantification; and the neuroscience content of the First Aid for the USMLE Step 1 book was used as a proxy for the content of the Step 1.

## RESULTS

While both resources covered a majority of the content in the list, the Step 1 preparatory materials covered a smaller fraction of those critical concepts than the course material.

## CONCLUSION

In conclusion, the results support a content difference between institutional courses and Step 1; with the latter not including material deemed important for adequate preparation of the students for the clerkships. Our methods also demonstrate the use of a Master List to evaluate and compare content coverage within a course.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# **Student, Administrator, and Faculty Perspectives on Lesbian, Gay, Bisexual, and Transgender-Related Curriculum Content**

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*<sup>2</sup>Department of Biomedical Sciences, Oakland University William Beaumont School of Medicine*

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## **INTRODUCTION**

The lesbian, gay, bisexual, and transgender (LGBT) minority historically has been neglected by medical professionals. However, medical schools today are shifting their attention to preparing medical students to better care for these patients. This study compares two subgroups (students and administrators/faculty) regarding their perspectives on the integration of LGBT-related education and training opportunities in a medical school curriculum.

## **METHODS**

Study participants (current medical students and faculty/administrators) were provided with a single, online survey to assess knowledge and attitudes towards particular LGBT health-related curriculum content. These were measured using freeform slider scales ranging from “nothing” to “a lot.” Using Qualtrics, the responses were assigned a whole-number value between 0 (nothing) and 100 (a lot). Respondents were also asked to assess the overall coverage of LGBT content, as a whole, using a symmetric five-level Likert scale ranging from “very poor” to “very good.”

## **RESULTS**

The analyses detected no significant differences comparing mean scores on knowledge and attitudes towards various teaching points between students and faculty/administrators. Across all 95 responses, mean scores for feelings of how well various curriculum topics are taught reached a maximum of 35 points, on a scale of 0 (nothing) to 100 (a lot). Across all responses, the mean response for rating the coverage of LGBT content on the whole was between “poor” and “fair.”

## **CONCLUSION**

While perhaps it is encouraging that the two subgroups felt that they knew similar amounts and that they felt that the curriculum topics were taught equally well, it is discouraging that the amount that they knew regarding LGBT-related curriculum topics was so low. Medical schools must integrate LGBT curricular content effectively in order to train physicians who will provide equal care to this minority.

# The Long-Term Influence of Survivors Teaching Students® on Medical Student Learning

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## INTRODUCTION

A unique program, Survivors Teaching Students® (STS®), works to address the need for survivorship care education in medical schools through the use of personal narratives. The program teaches about ovarian cancer by using the “patients-as-teachers” model. An analysis of this program will help determine its effectiveness and whether these methods could be applied to other diseases.

## METHODS

Previously, the STS® program was evaluated by a pre- and post-test conducted by the STS® presenters on the same day as the presentation. In order to determine if students retain the information, we sent an additional survey six months after the presentation to the third-year medical students at Oakland University William Beaumont School of Medicine. The post-survey contained the same seven multiple-choice questions as the pre-test and three new questions to determine use of knowledge and interest in the field. Composite data from the pre-test, post-test, and six-month post-survey were compared for retention of ovarian cancer facts, understanding of survivorship care concepts, and interest in the field of gynecology oncology.

## RESULTS

Fifty medical students completed the pre- and post-test on the day of the presentation. Nineteen medical students have completed the 6-month post-survey. When asked to list three ovarian cancer symptoms in the survey, 76% of the symptoms listed by students were one of the four symptoms described in the Ovarian Cancer Symptoms Consensus Statement. Additionally, one student has reported that she was able to diagnose a patient with ovarian cancer based on the information provided during the session.

## CONCLUSION

Although additional research would be needed, positive outcomes provide evidence of the program’s success at promoting long-term retention of concepts. Furthermore, it provides a basis for research into the use of this unique teaching method for other concepts in the medical school curriculum.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

*Recipient of the Nicholson Capstone Competitive Scholarship Award.*

# Exploring Cultural Competence in a Medical Education Curriculum

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## INTRODUCTION

As the demographics of the United States become more diverse, patient populations reflect the growing number of cultures represented. The American Association of Medical Colleges indicates “cultural competence in health care combines the tenets of patient/family-centered care with an understanding of the social and cultural influences that affect the quality of medical services and treatment”. Health care providers should learn to communicate in a culturally competent manner, as effective cross-cultural communication can affect health outcomes as well as patient satisfaction and compliance. This study explores the cultural competence curriculum at Oakland University William Beaumont School of Medicine (OUWB).

## METHODS

A content analysis will be performed on the curriculum at OUWB as implemented in Fall 2014. Various aspects of cultural competence represented within the curriculum will be identified as well as the frequency with which they are presented to students. As the majority of the topics pertaining to cultural competence are introduced during students’ first and second years, material presented during that time will be analyzed.

## RESULTS

The topics presented to students in the curriculum that pertain to cultural competency will be reported, as well as those that the curriculum does not address. Areas where student learning can be enhanced will be identified and can be strengthened for upcoming years.

## CONCLUSION

Analysis of the cultural competence curriculum may indicate the necessity for instructional changes to include those topics not represented. Thus, students will be best prepared to work with diverse patient populations in their future careers as physicians.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

# **Cultural Competency in Undergraduate Medical Education: A Systematic Review**

**Imo Udo-Inyang, M.S.<sup>1</sup>, Misa Mi, M.A., Ph.D.<sup>2</sup>**

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## **INTRODUCTION**

The Liaison Committee on Medical Education (LCME) stimulates that a medical education program provide educational experiences to develop medical students' skills, knowledge, and attitudes towards cultural competence to prepare them for the delivery of culturally competent medical care for an increasingly diverse patient populations. While most medical schools in the United States have instituted cultural competency education in their curriculum, research indicates that this curriculum might not address the issues that arise when caring for patients from diverse cultures. This systematic review was undertaken to synthesize evidence on cultural competency education in undergraduate medical curriculum in United States medical schools.

## **METHODS**

A comprehensive literature search of studies published between 2000 and 2015 was conducted using the databases of Cochrane Library, Embase, CINAHL, PsycINFO, PubMed, Scopus, and Web of Science. Search terms included index terms on concepts of cultural competence, culture, cultural diversity, medical students, medical education, and medical schools, in combination with relevant keywords such as cultural awareness, cultural sensitivity, and cross-cultural communication. Peer-reviewed, original research reports investigating the effectiveness of any cultural competence intervention integrated into the undergraduate curriculum of medical schools accredited by the LCME were selected, and full review of and data extraction from these sources was conducted independently and in duplicates.

## **RESULTS**

Of the 1334 citations retrieved from database searches, 15 full-text articles met criteria for review. There was wide variation in study designs, participants studied, cultural competency interventions, duration of interventions, and measurement tools for data collection. Stand-alone instructional interventions and learning experiences integrated into clerkship/elective curriculum were the most common interventions. Questionnaires and attitude surveys were the most frequently employed data collection tools, while attitudes and knowledge/awareness were the most frequently measured learning outcomes.

## **CONCLUSION**

These results indicate that there is no common way to teach cultural competency in undergraduate medical education while providing important insights into cultural competency education towards the development of culturally competent physicians.

# **Evolution of applicant perceptions of Oakland University William Beaumont School of Medicine (OUWB)**

**Alan M. Xi<sup>1</sup>, Juliana M. Bilowus<sup>2</sup>, Jason A. Wasserman, Ph.D.<sup>3</sup>**

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## **INTRODUCTION**

Since the recent inauguration of OUWB, the number of applicants has increased by approximately 150%, reflecting a rise of pre-medical interest in the school. This study investigates how applicant perceptions of the school changed over the past 5 application cycles. The findings will be informative for the array of new medical schools in their nascent stages of development, as well as other new programs in health and allied professions.

## **METHODS**

Student Doctor Network (SDN) is an anonymous Internet forum, where prospective and current medical students exchange opinions on each medical school in the United States. This study employed a grounded approach to systematically examine these narratives. Posts were extracted from the OUWB sub-forums in SDN spanning 5 consecutive application cycles from 2010-2011 to 2014-2015. Posts that provided pertinent information were tabulated and coded line-by-line by two separate coders. Emergent patterns in the data formed the themes that constitute the primary findings of this paper.

## **RESULTS**

Pre-medical applicants were primarily concerned in the early cycles about the newness of OUWB compared with the older, more established institutions. They were, however, generally impressed with the facilities, resources, curriculum, and community spirit through interview days and other sources. This gradually promoted a replacement in the initial anxiety with more confidence about the school among later cohorts. Over time, applicants began to shift their attention from the infrastructural features of the school (e.g. anatomy lab and Beaumont Hospital) to its organic components (e.g. faculty, students, and culture) that unfolded in a malleable learning environment.

## **CONCLUSION**

This study sheds light on applicant perspectives on a recently established medical school. It also provides a basis upon which new medical schools may focus their attention as they establish their reputations, build their brands, and navigate the competitive environment of attracting applicants.

# Human Trafficking Education and Assessment for Medical Students

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<sup>2</sup>Department of Biomedical Sciences, Oakland University William Beaumont  
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## INTRODUCTION

Human trafficking is a significant global health issue. Victims of human trafficking experience health problems, including injury, sexual assault, infectious diseases, substance misuse, untreated chronic medical conditions, malnutrition, and mental health disorders<sup>2</sup>. A recent study suggests that 87.8% of victims had been in contact with a health care professional while they were trafficked<sup>2</sup>. This places medical professionals in a unique position to interact with victims. Consequently, it is imperative that professionals acquire the skills to detect and care for these victims. This study aimed to determine whether an educational intervention increased medical students' awareness of human trafficking and altered their attitudes towards detecting and reporting victims.

## METHODS

The study was conducted with 98 students at the Oakland University William Beaumont School of Medicine. Participants listened to a presentation on recognizing and reporting victims of human trafficking, and completed a pre and post-session survey. Pre/Post survey questions were analyzed to assess alterations in responses. The outcomes evaluated were awareness of the crime, confidence identifying a potential victim, and willingness to report a victim. Additional information was gathered to assess students' opinions towards further interventions.

## RESULTS

Mean differences in pre-post scores on 4 item likert scale questions were evaluated, with positive differences showing an improvement in the concept being measured. Matched pairs t-tests found significant improvement ( $p < 0.001$ ) in responses to questions related to awareness of human trafficking (Mean Difference=0.61, SD=0.57), confidence in ability to detect a potential victim (Mean Difference=1.59, SD=0.79), and self-reported willingness to report a potential victim (Mean Difference=0.54, SD=0.79).

## CONCLUSION

The use of an educational intervention increased medical students' knowledge of human trafficking, as well as their confidence in detecting, and willingness to report potential victims. This finding supports the need for mandatory medical school curriculum focused on compassionately detecting and reporting potential victims of this egregious crime.

*Exceptional performance by students to disseminate their Capstone research (see back of booklet).*

*Recipient of the Nicholson Capstone Competitive Scholarship Award.*

*Class of 2017*

## **STUDENTS RECOGNIZED FOR EXCEPTIONAL CAPSTONE-RELATED PRESENTATIONS**

The following students are recognized for extending their Embark experience with poster and oral presentations at local, national, and international medical conferences. Their actions embrace the Embark mission and serve as inspiration to the community of OUWB medical students whose research is in progress.

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### **Mayank Agarwal**

Agarwal M, Makin J, Sims MD. Potential impact of rapid diagnostics in management of suspected pneumonia. Presented at: Oakland University Graduate Student Research Conference; May 2016; Rochester, MI.

### **Rayhaan Akram**

Akram RM, Wasserman JA. What factors influence change in glycated hemoglobin over time in an underserved population? Poster presentation: Oakland University Graduate Research Conference; May 2016; Rochester, MI.

### **Deirdre Bartlett**

Bartlett D, Kosmidis S, Kilburn K, Venuti J. Developing and assessing embryology web resources for medical education. Poster presented at: 5th Annual William Davidson Medical Education Week; May 2016; Royal Oak, MI.

### **Sneha Butala**

Butala S, Kuwajerwala N. Is obesity consultation a role for all physicians? Poster presented at: American Society of Breast Surgeons Annual Meeting; May 2015; Orlando, FL.

### **David Eisenbrey**

Eisenbrey D, Eisenbrey A, Pettengill P. Laryngeal cuff expansion and force application on a laryngeal analog during aeromedical evacuation modeling. Presented at: Society for Academic Emergency Medicine; September 2015; Toledo, OH. Winner of Best Basic Science Presentation

Eisenbrey D, Eisenbrey A, Pettengill P. Laryngeal cuff expansion and force application on a laryngeal analog during aeromedical evacuation modeling. *Air Medical J.* 2016 September-October 35(5):292-4. doi: 10.1016/j.amj.2016.05.001.

Eisenbrey D, Eisenbrey A, Pettengill P. Laryngeal cuff expansion and force application on a laryngeal analog during aeromedical evacuation modeling. Poster presented at: Michigan State Medical Society Annual Meeting; October 2015; Troy, MI.

Eisenbrey D, Schneider J. Transparency, cost and quality. Presented at: American Medical Association - Medical Student Section Interim Meeting; 2014; Dallas, TX.

### **Kassem Faraj**

Faraj K, Dereski, M. Physician awareness of patients on the autism spectrum. Presented at: Oakland University Center for Autism Enrichment Event; November 2015; Rochester, MI.

Faraj K, Dereski M. Relationship between physicians and patients with autism spectrum disorders: a proposed project. Poster presented at: Beaumont Medical Education Week; March 2014; Royal Oak, MI.

### **Jonathan Fergus**

Fergus J, Chittick P. An EMR driven order set to guide appropriate antibiotic selection for outpatients with acute respiratory tract infections. Presented at: Oakland University Graduate Research Symposium; May 2016; Rochester, MI.

**Aaron Hanson**

Hanson AM, Thomas DM. Financial analysis of outpatient surgery based on payment model. Poster presented at: Oakland University Graduate Student Research Conference; May 2016; Rochester Hills, MI.

**Jonathan Hung**

Hung J, Taylor AR, Divine GW, Hafron JM, Hwang C. The effect of time to castration resistance on outcomes with abiraterone and enzalutamide in metastatic prostate cancer. *Clinical Genitourinary Cancer*. 2016 Oct;14(5):381-388. doi: 10.1016/j.clgc.2016.03.021.

Hung J, Taylor AR, Divine GW, Hafron JM, Hwang C. Do primary hormonal therapy outcomes predict subsequent response to abiraterone or enzalutamide in metastatic castration-resistant prostate cancer? Poster presented at: American Urological Association Annual Meeting; May 2015; New Orleans, LA.

**Alyssa Kirsch**

Kirsch AK, Doyle KJ. Assessing caregiver perceptions of physician communication with disabled patients. Poster presented at: Michigan State Medical Society Annual Scientific Meeting; October 2016; Novi, MI.

**Tania Kohal**

Kohal, T. Efficacy of outreach on individuals based on prior HIV testing and counseling in seeking further preventative information. Poster presented at: 2nd World Congress on Infectious Disease; August 2016; Philadelphia, PA.

Kohal, T. Efficacy of outreach on individuals based on prior HIV testing and counseling in seeking further preventative information. Poster presented at: Oakland University First Graduate Student Research Conference; May 2016; Auburn Hills, MI.

**Andrew Leamon**

Leamon A, Wasserman J. The effect of housing on overuse of the emergency department. Presented at: Oakland County Homeless Healthcare Collaboration; November 2015; Waterford Township, MI.

Leamon A, Wasserman J. The effect of housing on overuse of the emergency department. Poster presented at: International Street Medicine Symposium; October 2015; San Jose, CA.

**Brian Malley**

Malley BE, Sawyer KN, Swor RA. Association of hospital characteristics with outcomes of patients resuscitated after out of hospital cardiac arrest. Poster presented at: National Association of EMS Physicians Annual Meeting; January 2017; New Orleans, LA.

**Saritza Mendoza**

Mendoza S, Nojkov B, Mitchell C. Endoscopists do not exhibit economic discrimination in scheduling earlier surveillance colonoscopy based on higher insurance payments: A study of 136 consecutive surveillance colonoscopies at William Beaumont Hospital. 2015. *Am J Gastroenterology*; 110:S560. doi:10.1038/ajg.2015.294

**Aishwarya Navalpakam**

Navalpakam A, Dany M, Hajj Hussein I. Behavioral perceptions of Oakland University female college students towards Human Papillomavirus Vaccination. *PLoS One* 2016 May;11(5):e0155955. doi: 10.1371/journal.pone.0155955.

Navalpakam A, Dany M, Hajj Hussein I. Behavioral perceptions of female college students towards human papillomavirus vaccination. Poster presented at: American Society for Microbiology Conference; May 2015; New Orleans, LA.

**Brian Odom**

Odom BD, Ehler MJ, Killinger KA, Peters KM. Chronic neuromodulation as a treatment for persistent genital arousal disorder. Presented at: 111th Annual Meeting of the American Urological Association; May 2016; San Diego, CA.

Odom BD, Ehler MJ, Killinger KA, Peters KM. Chronic neuromodulation as a treatment for persistent genital arousal disorder. Presented at: Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction 2016 Winter Meeting. February 2016; New Orleans, LA.

Odom BD, Ehler MJ, Killinger KA, Peters KM. Characteristics and treatments used in women with persistent genital arousal disorder. Presented at: Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction 2016 Winter Meeting; February 2016; New Orleans, LA.

**Julia Orlovskaja**

Orlovskaja J, Sabina RL, Degnan BM. Development of a pre-clinical elective for medical students at a residential diabetes camp. Poster presented at: Medical Education Week; May 2015; Birmingham, MI.

Orlovskaja J, Raynal E. Kids just wanna have fun: Summer opportunities for children with a chronic illness. Presented at: Lunch and Learn Lecture; February 2015; Rochester, MI.

**Valerie Osula**

Osula V, Patino G, Mi M, Gould D. Content evaluation of a neuroscience course in an integrated system-based curriculum. *Med.Sci.Educ.* 2016. Dec; doi:10.1007/s40670-016-0362-4.

**Matthew Peters**

Peters M, Brand M, Almany S. The efficacy of quick-look echocardiograms in cardiovascular preparticipation screening for high school athletes. Poster presentation at: Michigan ACP Conference; August 2015; Traverse City, MI.

**Ryan Quick**

Quick RT, Sawyer KN. Acute kidney injury following cardiac arrest in patients treated with therapeutic hypothermia. Poster presented at: Beaumont Summer Internship Program Poster Presentation Event; August 2014; Rochester, MI.

**Lauren Quinn**

Quinn L, Sullivan M, Wasserman JA. Factors resulting in overuse of the ED by the homeless. Poster presented at: Graduate Research Conference, Oakland University; May 2016; Rochester, MI.

Quinn L, Sullivan M, Wasserman JA. Factors resulting in overuse of the ED by the homeless. Presented at: Homeless Healthcare Collaboration, Oakland County Michigan; November 2015; Pontiac, MI.

**Michael Rezaee**

Rezaee ME, Pollock M. Prevalence and associated cost and utilization of multiple chronic conditions in the outpatient setting among adult members of an employer-based health plan. *Popul Health Manag.* 2015 Dec;18(6):421-8. doi:10.1089/pop.2014.0124.

Rezaee ME, Pollock M. Multiple chronic conditions among outpatient pediatric patients, Southeastern Michigan, 2008-2013. *Prev Chronic Dis.* 2015 Feb;12(E18). doi:10.5888/pcd12.140397.

**Alexa Shepherd**

Shepherd A, Field J. The long-term influence of Survivors Teaching Students on medical student learning. Poster presented at: American Medical Women's Association Centennial Annual Meeting; May 2016; Chicago, IL.

Shepherd A, Field J. The long-term influence of Survivors Teaching Students on medical student learning. Poster presented at: Fourth Annual William Davidson Medical Education Week; May 2015, Birmingham, MI.

**Lauren Singer**

Singer LS, Brown EA, Lanni TB. Margins in breast conserving surgery: The financial cost & potential savings associated with the new margin guidelines. *The Breast*. 2016 Aug;28(1):1-4. doi: 10.1016/j.breast.2016.04.007.

Singer LS, Brown EA, Lanni TB. Margins in breast conserving surgery: The financial cost & potential savings associated with the new margin guidelines. Poster presented at: American Society of Breast Surgeons Conference; May 2015; Orlando, FL.

**Karis Stevenson**

Stevenson K, Douglas-Nikitin V, Farr C. Exploring cultural competence in a medical education curriculum. Poster presentation at: Oakland University William Beaumont School of Medicine Medical Education Week; May 2015; Birmingham, MI.

**Kristin Totoraitis**

Totoraitis K, Dereski M. Assessing the need for autism spectrum disorder physician education. Poster presented at: Michigan State Medical Society Annual Scientific Meeting; October 2015; Troy, MI.

Totoraitis K, Dereski M. Assessing the need for autism spectrum disorder physician education. Poster presented at Medical Education Week, Oakland University William Beaumont School of Medicine; May 2015; Rochester, MI.

**Anthony Turk**

Turk AA, Fahim DK. Radiofrequency tumor ablation and vertebroplasty for the treatment of spinal metastases. In: Perez-Cruet, MJ. *An anatomic approach to minimally invasive spine surgery*. 2nd ed. (In press).

Turk AA, Fahim DK. The addition of radiofrequency tumor ablation and vertebroplasty to radiation therapy for treatment of spinal metastases. Poster presented at: American Medical Student Association Annual Convention; April 2016; Washington, D.C.

Turk AA. Safety and efficacy of treatment modalities for spinal metastases. Presented at: Robert J. Lucas Surgical Society Research Symposium; February 2016; Royal Oak, MI.

**Theresa Yankovich**

Yankovich T, Yoskowitz R. Human trafficking education and assessment for medical students. Poster presented at: 5th Annual William Davidson Medical Education Week; May 2016; Royal Oak, MI.

Yankovich T, Yoskowitz R. Human trafficking education and assessment for medical students. Poster presented at: American Public Health Association's 143rd Annual Meeting and Exposition; November 2015; Chicago, IL.

Yankovich T, Yoskowitz R. Human trafficking education and assessment for medical students. Poster presented at: Indiana Wesleyan University Health and Human Trafficking Conference; May 2015; Marion, IN.

# CAPSTONE COMPETITIVE SCHOLARSHIP AWARD RECIPIENTS

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## THE RAVITZ FOUNDATION CAPSTONE RESEARCH MANUSCRIPT OF THE YEAR

**Michael Rezaee**

*Prevalence and Associated Cost and Utilization of Multiple Chronic Conditions in the Outpatient Setting among Enrollees of an Employer-based Health Plan*

## THE NICHOLSON CAPSTONE COMPETITIVE SCHOLARSHIP AWARDS

**Mayank Agarwal**

*Potential Impact of Rapid Diagnostics in Management of Suspected Pneumonia*

**Sarah Gaubatz**

*Improving Parental Attitudes Towards Vaccinations with an Interactive Educational Session: A Pilot Study*

**Aishwarya Navalpakam**

*Behavioral Perceptions of Oakland University Female College Students towards Human Papillomavirus Vaccination*

**Alexa Shepherd**

*The Long-Term Influence of Survivors Teaching Students® on Medical Student Learning*

**Theresa Yankovich**

*Human Trafficking Education and Assessment for Medical Students*

*The Oakland University William Beaumont School of Medicine is grateful to the following supporters for funding the Capstone Competitive Scholarships: Ann V. Nicholson, The Ravitz Foundation and The Newman Family Foundation.*

# DEAN'S CHOICE CAPSTONE ORAL PRESENTATION AWARDS

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## 1ST PLACE

**David Tobin**

*Easing the Transition: A Program for College-bound Teens with Diabetes*

## 2ND PLACE

**Aaron Hanson**

*Financial Analysis of Outpatient Surgery Based on Payment Model*

## 3RD PLACE

**Dylan Greeney**

*Why do patients delay seeking treatment for non-melanoma skin cancer?*





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