

A close-up, low-angle photograph of a microscope's objective lenses and eyepiece, set against a bright, blurred background. The lighting is warm and golden, creating a professional and scientific atmosphere.

Class of 2021

EMBARK CAPSTONE COLLOQUIUM

OU
WB | *School of*
MEDICINE

A Message from Dean Mezwa

Dear OUWB Community,

Welcome to the Embark Capstone Colloquium, an OUWB tradition that provides an opportunity for the Class of 2021 to showcase the efforts of their wide-ranging research projects.

The colloquium is a culmination of a four-year long journey that is guided by Embark mentors – basic science and clinical faculty members – who work with our students on their research. We thank these individuals for their realization that this mentorship is a fundamental contribution to the future of OUWB and its graduates; we sincerely value their commitment to our students' success.

It is at this point in the M4 year that we are reminded of our medical students' potential to achieve scientific or social impact through their findings. We truly hope that this enriching experience, made possible through the Embark Program, inspires an appreciation for self-directed learning and a lifelong desire to explore and contribute to the research community.

This year, we have re-imagined the colloquium experience in a digital format. The pages within this document feature project abstracts and page links connecting to each student's research poster.

On behalf of the OUWB faculty and staff, I congratulate the Class of 2021 for successfully accomplishing the research component of the OUWB medical school education.

Sincerely,



Duane Mezwa, M.D., FACR

Stephan Sharf Dean, Oakland University William Beaumont School of Medicine



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Implementation of a Food Insecurity Questionnaire for ERAS Colorectal Patients

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Introduction

Food insecurity is a condition where households have limited or uncertain availability of nutritionally adequate and safe foods. Food insecurity is a prevalent and modifiable public health concern with 12.3% (15.6 million) households in the United States currently deemed food insecure by the US Department of Agriculture (USDA). There is mounting evidence that food insecurity is associated with worse health outcomes spanning multiple populations and medical conditions. Enhanced Recovery After Surgery (ERAS) programs are multi-modal, evidence-based care pathways implemented perioperatively to promote recovery and reduce perioperative morbidity. ERAS protocols have been successfully implemented throughout multiple surgical disciplines and are emerging as the standard of care for perioperative management throughout the world. This study will investigate the prevalence of food insecurity in the elective colorectal surgical population presenting to the ERAS clinic.

Methods

Patients admitted into the ERAS program will be administered Food Insecurity and Nutritional Questionnaire (FINQ) into their preoperative paperwork. Immediate and 30-day postoperative outcomes will be retrospectively assessed in each patient looking at postoperative complications (e.g., anastomotic leak, hemorrhage, prolonged length of stay) and mortality rates.

Results

Food insecurity has been determined to be a prevalent issue with 9.7% of colorectal patients at Beaumont Health Royal Oak screening positive. Food insecure patients are more likely to be non-White ($p < 0.001$). Hospital length of stay was determined to be longer in food insecure patients ($p < 0.001$).

Conclusions

The results support the hypothesis that food insecurity in the colorectal population leads to increased hospital length of stay (>3 days) compared to their cohort. Mortality rates approached but did not reach statistical significance ($p = 0.06$). Nutritional adherence is instrumental to ERAS protocol and its effects at minimizing postoperative morbidity rates. Identifying food insecure patients within the colorectal population can be beneficial to hospitals and patients alike.

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Long-Term Quality of Life Outcomes After Treatment of Head and Neck Cancer

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Introduction

Current treatments for head and neck cancer result in functional changes to aspects of patient quality of life (altered appearance, difficulty swallowing, inability to eat or drink, changes in speech, mood, social interaction, relationships). It is critical for providers to understand these changes to better select treatment methods and assist patients with management of sequelae of current oncologic treatments. Currently there exists little data on long term quality of life of head and neck cancer survivors. This study aims to find out more about the long-term quality of life of the patient population at Henry Ford.

Methods

All patients with head and neck cancer treated at Henry Ford see a speech pathologist responsible for presenting a questionnaire with five sections: physical, social/family, emotional, and functional well-being, and additional concerns. Each variable is answered on a scale of 1-5 (Not at all, a little bit, somewhat, quite a bit, very much). This survey is given pre-treatment, 3-6 months post-treatment, and yearly for 5 years.

Results

Many physical, functional, and additional concern metrics showed worsening post-treatment, with improvement and return to baseline over time. The majority of social and family metrics remained near baseline over time. Physical well-being metrics showed improvement in pain and nausea. Social and family well-being metrics showed decreased support from family. Emotional well-being metrics showed improvement in nervousness. Functional well-being metrics showed improvement in acceptance of illness. Additional concern metrics showed improvement in pain level, increased alcohol consumption, and increased swallowing difficulty and discomfort.

Conclusions

The results of this research will provide data to better describe the relevant quality of life changes experienced by patients undergoing head and neck cancer treatment. This will assist with quality improvement measures to ensure that these changes are addressed by healthcare providers and guide future research into prevention or treatment of these life changes.

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Effect of Antidepressants on Rapid Eye Movement Sleep and Quality of Life

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Introduction

Many antidepressants decrease rapid eye movement (REM) sleep, which may affect patients' quality of life due to issues such as daytime sleepiness. Counterintuitively, prior research suggests that REM deprivation may actually decrease depressive symptoms, suggesting an improvement in quality of life. The aim of this study was to elucidate the relationship between antidepressants, sleep, and quality of life.

Methods

This was a retrospective chart review study, with 300 subjects. All subjects participated in sleep studies for suspected sleep apnea. Some subjects were later diagnosed with obstructive sleep apnea, whereas others were negative. Sleep study data were examined to look at the relationship between antidepressant usage, REM sleep, and quality of life. Demographics and comorbidities were considered. Statistical analyses included t-tests, ANOVA analyses, and chi-squared tests.

Results

Subjects taking antidepressants spent less time in REM sleep ($p=0.023$). Subjects on antidepressants had increased REM sleep latency ($p=0.000$) and were more likely to have a complete lack of REM ($p=0.001$). Presence of REM sleep was associated with better quality of life ($p=0.031$). Subjects taking antidepressants were more likely to have poorer quality of life scores ($p=0.047$).

Conclusions

Given that REM sleep was associated with better quality of life and that subjects taking antidepressants were more likely to have a lack of REM, it is possible that the poorer quality of life scores in the antidepressant group are due to decreased REM. This suggests that decreased REM sleep in patients on antidepressants is overall detrimental rather than therapeutic.

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Incidence of Nephropathy in Patients Receiving Intra-venous and Intra-arterial Contrast During the Emergent Workup and Treatment of Acute Ischemic Stroke

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Introduction

Contrast-induced nephropathy (CIN) is a feared complication of contrast administration. Previous data suggests patients who receive contrast-enhanced CT Perfusion (CTP)/CT angiography (CTA) for ischemic stroke workup are no more likely to develop CIN, compared to controls who received no contrast. Cerebral arteriogram is indicated in a subset of patients and requires additional contrast. The primary goal of this study is to determine if there is a significant difference in the association with CIN in patients requiring arteriogram, compared to those who received CTP/CTA only or no contrast. This information may direct future investigations aimed to guide decision making in this time-sensitive setting.

Methods

Electronic medical records of 1500 patients presenting to Beaumont Royal Oak with stroke signs from 1/2011-4/2016 were retrospectively analyzed. 722 patients remained after applying inclusion criteria. 331 of these patients received CT without contrast (0 mL of contrast). The remaining 391 patients received CTP/CTA (standard dose of 40 mL of Isovue-370 contrast). The patients who received CTP/CTA were further divided into two distinct groups -patients who only received CTP/CTA (CTP/CTA only group, n= 335) and patients who received CTP/CTA + cerebral arteriogram with a variable dosage of Isovue-250 contrast (arteriogram group, n= 56). Logistic regression was used to obtain an odds ratio (OR) to compare the risk of developing CIN between the arteriogram, and both the CTP/CTA only and no contrast groups.

Results

There was no statistically significant difference in the association with CIN between the arteriogram group and both the CTP/CTA only (OR 0.91, 0.37–2.26), and no contrast (OR 0.98, 0.39–2.45) groups.

Conclusions

There was no significant association with CIN in the group of patients who received two doses of contrast, compared to the groups who received one and zero doses of contrast. This lends further support for the use of these modalities in this setting.

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

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Introduction

Breast cancer is the most common cancer in women in the United States. Treatment takes an emotional and physical toll. Beaumont Health's Integrative Medicine department (BHIM) offers individualized clinical massage therapy in order to reduce symptoms relating to fibrosis, lymphedema, pain, anxiety, range of motion, and neuropathy. This pilot study analyzes the effectiveness of massage therapy on mastectomy patients by studying the effects of five massage sessions over eight weeks. Benefits of the therapy sessions are measured based on range of motion in the shoulder. This study quantifies the benefits of massage therapy on range of motion in post-mastectomy patients.

Methods

Ten patients who were 6-24 months post-unilateral mastectomy were enrolled from the Breast Care Centers of Beaumont Health to receive five massage treatments. Range of motion, including flexion, extension, abduction and external rotation, was evaluated by Licensed Massage Therapists before and after each massage. Additionally, range of motion was evaluated on the non-operative (non-massaged) shoulder before the start of treatment and after the final sessions. A paired t-test was used to evaluate changes in range of motion during each session and cumulatively from the five sessions.

Results

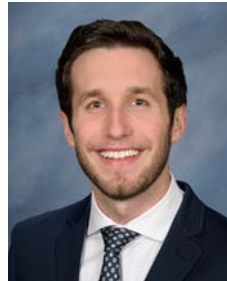
Over the cumulative course of the five massage sessions, the treatment group displayed a statistical improvement in the area of shoulder flexion, with an increase in range of motion of $24.67^\circ \pm 14.55$ ($p < 0.001$).

Conclusions

A statistical improvement in shoulder extension of the post-mastectomy shoulder was demonstrated. Abduction, flexion and external rotation showed improvement, although not statistically significant. Interestingly, extension, flexion and abduction of the non-operative shoulder decreased over the same period (not statistically significant). Massage therapy shows promise for a low-cost therapy to improve range of motion. This study will be continued to increase enrollment and analyze the impact on quality of life. Follow-up studies should be considered to determine long-term benefit.

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Implementation and Evaluation of Alcohol Screening Tool in HIV Patients

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Introduction

In November 2018, the US Preventative Service Task Force (USPSTF) advised screening for hazardous alcohol consumption in primary care settings for all adults. As a new standard of care, this study utilized the AUDIT (Alcohol Use Disorders Identification Test) to identify at-risk drinking among HIV patients in a primary care setting at Beaumont Hospital's HIV clinic in Royal Oak, Michigan.

Methods

Patients who completed an AUDIT survey were enrolled in this retrospective study. Men (aged 18-60) screened positive for at-risk drinking if they scored 8 or higher. Men (older than 60) and women of all ages screened positive for at-risk drinking if they scored 4 or higher. Statistical analysis was completed to compare AUDIT scores to various measures including age, CD4 count, HIV viral load. Analysis between groups was made using T-tests, Chi-Square tests, and odds ratios (OR), with corresponding 95% confidence intervals. Comparisons between AUDIT scores and lab work were only performed if both were completed within 30 days of each other. Between February 5, 2019 and March 10, 2020, 161 AUDIT forms were completed. Of those, 135 were included in the analysis (18 female, 117 male), as 26 AUDIT forms were excluded due to incomplete corresponding lab work.

Results

Among the 135 patient encounters included in the analysis, 14 (10.3%) encounters were positive for "At-Risk" drinking. There was a statistically significant association between "At-Risk" drinking and increased age (54.93 years vs. 47.08 years, $P = 0.0205$). There was no significant association between "at-Risk" drinking and CD4 count or HIV viral load.

Conclusions

The association between "at-Risk" drinking and increased age could serve as a modifiable risk factor, which could improve patient outcomes and strengthen the patient-physician relationship. Future studies should incorporate the AUDIT form into patient EMRs, to enable alcohol screening during tele-health appointments.

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Safety and Efficacy of Centrifuge Concentrated Intravitreal Triamcinolone Acetonide

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Introduction

Intravitreal Triamcinolone Acetonide is a common steroid used to treat a variety of ocular disorders. Previous studies have shown that centrifuge concentration results in a longer duration of effect from a larger dose delivered per volume and therefore greater convenience and cost effectiveness. We report on the safety and efficacy of centrifuge-concentrated triamcinolone acetonide (CCTA) for intravitreal injection.

Methods

A retrospective case series was conducted of patients from a single private practice vitreoretinal surgeon in Southfield, Michigan from January 1, 2015 to December 31, 2018. We evaluated all eyes that received injections of centrifuge concentrated triamcinolone acetonide during this period, excluding those with a prior vitrectomy, incomplete data or lack of post-injection follow up.

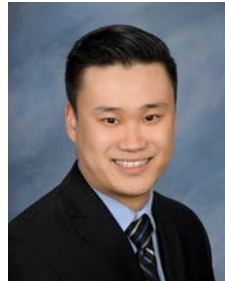
Results

Data was collected for a total of 340 injections. Following the intravitreal injection of CCTA, 175 (56.3%) patients developed an increase in IOP, while 136 (43.7%) either had no change or a decrease in IOP. Fifty-five (17%) of the treated eyes developed glaucoma (based on increase in IOP or initiation of new IOP-lowering medications), 21 (6.5%) developed cataracts (new-onset lens opacities), 3 (0.9%) developed endophthalmitis and 18 (5.5%) resulted in drug dispersion leading to temporary vision loss. The average post-injection IOP was 18.51 mmHg \pm 4.87 (SD) and the average change from initial to final IOP was +2.33 mmHg \pm 4.67 (SD). Average change in CFT was -156.38 \pm 178.57 (SD).

Conclusions

Centrifuge concentration of intravitreal triamcinolone injection results in a similar rate of glaucoma and endophthalmitis compared to other injection techniques, but there was a significant rate of drug dispersion leading to temporary vision decline. The data supports our hypothesis that CCTA is an excellent treatment option for patients where the benefits of long-term intravitreal ocular steroid treatment outweigh the potential risks.

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Analysis of Contact vs. Non-Contact ACL Injuries in Student Athletes

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Introduction

Anterior Cruciate Ligament (ACL) injuries have long been associated with contact collisions or high stress maneuvers in sports. Although current literature investigates exact mechanisms behind ACL injuries, these studies rely on assessments that are not readily available, such as knee angles and weight-bearing pressures that lead to injury. This study aims to explore not only the specific event (contact vs. non-contact), but also the risk of injury based on their previous history.

Methods

This retrospective study included high school student athletes that suffered ACL injuries between 2016 and 2018. Subjects were enrolled using Sportsware, the electronic medical records utilized by Beaumont Health's Athletic Training program. Specific variables that were assessed included the mechanism (contact vs. non-contact) of injury, history of knee pain or injury, the sport in which the injury occurred, age, and gender.

Results

In total, 33 student athletes were identified as having ACL injuries between 2016 and 2018, with an average age of 16 years at the time of injury. Of these, 60.6% (n=20) were female and 39.4% (n=13) were male. The majority occurred during non-contact events (n=21, 63.6%). Soccer was the most common sport (n=12, 36.4%), followed by football (n=7, 21.2%), basketball (n=6, 18.2%), volleyball (n=3, 9.1%), wrestling (n=3, 9.1%), lacrosse (n=1, 3%), and track & field (n=1, 3%). The majority of these student athletes did not have any previous history of knee pain or injury (n=27, 81.8%).

Conclusions

The majority of ACL injuries occurred during a non-contact event, in females compared to males, and in soccer when compared to other sports. Although the vast majority did not have any previous history of knee pain or injury, more research aimed at identifying at-risk athletes may reduce the incidence of this devastating injury in all levels of competitive sports.

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The Impact of Physical Therapy Consults in the Emergency Department

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Introduction

Emergency departments (EDs) nationwide have experienced increases in patient volume with many visits related to lower acuity acute or chronic musculoskeletal pain. This can lead to overcrowding in the department which places pressure on emergency providers to care for more patients without compromising quality of care. To mitigate this, EDs are implementing physical therapy consults for specialized patient care. In 2016, Beaumont Hospital - Troy started a consult program to treat a variety of conditions, including musculoskeletal pain. We aimed to describe the role physical therapists play in the emergency department while analyzing the impact physical therapy consults had on variables related to patient care, especially with regards to outpatient PT follow-up.

Methods

A chart review was conducted on patients with ICD-10 codes related to back and neck pain who received consults from November 2016 to December 2017. Patients excluded had symptoms concerning for non-musculoskeletal pain, fever, or focal neurological deficits. Our primary outcome measure was the enrollment of patients into outpatient PT and their compliance with follow-up. Secondary outcomes included demographics and variables related to their ED visits. Data were analyzed using descriptive statistics.

Results

108 patients were identified with a median age of 54 years. 45.5% followed up with outpatient PT and 70% were compliant with follow-up. 13.0% had repeat visits. Ketorolac was the most common analgesic given in the ED (56.5%) and hydrocodone-acetaminophen was prescribed most often at discharge (51.5%). 51.9% received imaging with x-ray being the most common modality (87.5%). The average length of stay was 222 minutes.

Conclusions

During this study, we were able to enroll patients into outpatient PT, a significant majority of whom were compliant. This study provides a framework to quantify the impact of an ED-based PT consult service in regard to ED recidivism, pain control, patient satisfaction, and ED disposition.

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Skin Surface Dosimetry as a Predictor for Unplanned Surgery or Implant Failure After Post-Mastectomy Radiotherapy

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Introduction

Post-mastectomy radiotherapy (PMRT) improves survival in appropriately selected patients, but is associated with morbidities such as unplanned surgery (US) and implant loss (IL), ultimately contributing to inferior cosmesis. If reliable dosimetric correlates for these outcomes can be found, inverse planning may be useful to reduce their occurrence. We hypothesize that skin surface dosimetry predicts for increased US and IL risk.

Methods

Patients who received PMRT at a single institution from 2016-2019 were retrospectively analyzed. Demographic, clinical, and treatment parameters were reviewed. Three structures were retrospectively generated, encompassing volumes 0-3 mm (SR3), 0-5 mm (SR5), and 5-10 mm (SR10) from the skin surface. Dose volume histograms (DVHs) were exported for analysis. Univariate (UVA) and multivariate analyses (MVA) were used to identify predictors of US and IL among demographic and treatment variables. Dosimetric analysis was performed to determine candidate dose constraints for SR3, SR5, and SR10. Clinical variables included smoking history, hypertension and diabetes.

Results

Of 127 patients reviewed, 108 were analyzable. Median follow up was 2.3 years. Twenty-five patients (23%) underwent US, 10 (9.2%) of whom experienced IF. Among clinical variables, BMI significantly predicted for US on UVA, while former smoking status was significant on both UVA and MVA. There were no significant predictors of IF. Dosimetric analysis identified $V50Gy < 55$ cc (AUC 0.693) and $D5cc < 59.3$ Gy (AUC 0.696) to SR3 as potentially useful for predicting US. Both $V50Gy$ (OR 0.18, 95% CI 0.03-0.85) and $D5cc$ (OR 0.14, 95% CI 0.03-0.58) to SR3 were significant for US on MVA.

Conclusions

Skin surface dosimetry appears to predict for US following PMRT. $V50Gy < 55$ cc and $D5cc < 59.3$ Gy to SR3 should be further explored as constraints for inverse planning optimization. The absence of significant predictors for IF is likely due to a paucity of events.

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Rate of Antibiotic Change Following Empiric Treatment for Suspected Urinary Tract Infections

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Introduction

When treating urinary tract infection (UTI) urine culture delay forces clinicians to decide whether to start empiric antibiotics, possibly incorrectly. We evaluated empiric antibiotic use and subsequent change in a female pelvic urology practice.

Methods

Patients (>18 yrs) with suspected UTI and urine culture from 1-2016 to 6-2016 were retrospectively reviewed. Patients with a positive culture (defined as $>10^3$ CFU) were categorized by whether or not they were treated empirically. Empiric treatment was evaluated for associations with clinical-demographic data, symptoms, and urinalysis (UA). Antibiotic change was evaluated with clinical-demographic data, urine culture results, and resistance patterns. Statistical significance of differences between groups was assessed with chi-square or Fisher's exact test for categorical variables and t-test for continuous measures.

Results

916 urine cultures (636 patients) were included. 391 (43%) cultures were positive, and 164 (42%) were treated empirically. Clinical data including age, gender, BMI, history of diabetes mellitus, or immunosuppression did not differ between groups. Those treated empirically had more UTI symptoms (93% vs 58% $P<0.001$), and UA abnormalities including positive nitrites (51% vs 29% $P<0.001$), 3+ leukocyte esterase (27% vs 19% $P=0.002$) and 3+ blood (13% vs 4% $P=0.005$). Of those treated empirically, 42/164 (26%) required an antibiotic change. Antibiotic change was associated with immunosuppression (12% vs 2% $P=0.027$) and >3 antibiotic resistance (33% vs. 20%, $P=0.039$). Patients requiring empiric antibiotic change also had higher rates of fluoroquinolone (50% vs 30% $P=0.016$), monobactam (19% vs 7% $P=0.042$) and TMP-SMX (52% vs 19% $P<0.001$) resistance.

Conclusions

Almost half of patients presenting with clinical UTI were treated with empiric antibiotics. Factors associated with empiric treatment included clear UTI symptoms and abnormal UA. Antibiotic change was driven largely by bacterial resistance. New technologies that allow rapid bacterial identification and sensitivity in urine may greatly improve patient care.

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Multidisciplinary Management of Rectal Cancer Affecting Access to Comprehensive Care and Overall Cancer-Free Survival

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Introduction

A multidisciplinary approach to colorectal cancer management began at Beaumont Hospital, Royal Oak in 2009 with implementation of a tumor board and virtual clinic. It has been postulated that approaching complex disease processes in a multidisciplinary setting provides greater continuity of care as well as greater adherence to treatment guidelines, presumably leading to better outcomes. While similar paradigms have been successful in other complex disease states, evaluation of the Beaumont clinic's management of rectal cancer has yet to be determined. The primary goal of this study is to assess the multidisciplinary approach on patient access to comprehensive, multimodal care and its subsequent impact of cancer-free survival rates.

Methods

In a retrospective chart review, data was collected on 185 rectal cancer patients having undergone treatment through the multidisciplinary tumor board and clinic within the Colorectal Surgery department at Beaumont Health Royal Oak Hospital from January 2009 to January 2018. Descriptive data included demographics, staging, preoperative evaluation comprehensiveness, treatments, access to multimodal care, and overall and cancer-free survival rates at three-, five-, and seven- year increments.

Results

Recurrence rates showed an overall rate of 32.5% with significantly worse rates between stages 1 ($p=0.0005$), 2 ($p=0.0001$) and 3 ($p=0.0033$) when compared to stage 4. Five-year survival rates differed between stages 1 and 3 ($p=0.0303$) and between stages 1 and 4 ($p=0.0101$) and trended down in average years of cancer-free survival, three-year, five-year, and seven-year survival percentages.

Conclusions

The results provide foundational knowledge of the rates of comprehensive preoperative evaluation, access to multimodal care and recurrence/survival rates for the first ten years of Beaumont Health Royal Oak's multidisciplinary clinic's management of rectal cancer. This will provide the basis for comparison for further changes within the clinic, the department and treatment strategies as a whole.

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Hippocampus Segmentation on Non-contrast CT Using Deep Learning

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Introduction

Whole brain radiotherapy (WBRT) is correlated with loss of neurocognitive function due to radiation induced damage to the hippocampus. Hippocampal avoidance (HA)-WBRT has shown to decrease the rate of neurocognitive decline in patients who receive WBRT. Since HA-WBRT traditionally requires MRI for treatment planning, which increases time to delivery and treatment planning complexity, a deep learning model was created to forgo the need for MRI and segment the hippocampus directly from CT images. This study seeks to investigate whether deep learning models, with the creation of an attention gated (AG)-3D ResNet, can delineate or contour the hippocampus on computed tomography (CT) images alone.

Methods

Retrospectively, 390 Gamma Knife patients with both CT and MR images had their hippocampi manually contoured to create the ground truth to train the deep learning model. After CT and MR images were fused, the images were processed with the addition of a body contour, center of mass, and soft-tissue and bone image leveling. Our novel model, the AG-3D ResNet was compared to other deep learning models, including the 3D U-Net, the Dilated 3D U-Net, and the High-Res3DNet. The Dice score and the Hausdorff distance (HD) were used to assess the similarity between the ground truth and each models' predicted left and right hippocampus. Using the RTOG 0933 standard for clinical acceptability, the deep learning contours were compared to physician contours.

Results

The bilateral RTOG passing rate for the AG-3D ResNet was 80.2%, a passing rate comparable to physicians in the RTOG 0933 Phase II clinical trial ($p = 0.3345$). Additionally, the AG-3D ResNet significantly outperformed the other models ($p < 0.05$).

Conclusions

Treatment planning for HA-WBRT with the use of CT and deep learning networks has the potential to increase the quality of life in patients with brain metastases.

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Gender Disparities in Time to Administration of Pain Medication in Pediatric Patients

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Introduction

Gender disparities are a well-known issue for the U.S. Healthcare system. Literature has shown that gender disparities exist across all aspects of healthcare management and treatment including the administration of pain medication. This Embark capstone project seeks to discover if gender disparities exist in the Pediatric Emergency Department (PED) when treating long bone fractures. We will seek to determine if there are disparities in time to pain medication administration as well as discrepancies in discharge prescriptions.

Methods

This is a retrospective chart review including all pediatric patients (ages 0-17) who presented to the Royal Oak PED from 1/1/2010 to 12/31/2017, with a discharge diagnosis of long bone fracture. Specific variables collected include gender, age, time of arrival and time to pain medication administration. The data analysis will then determine if the time to pain medication administration was different for male versus female patients. Statistical analysis will include a multi variant regression analysis for the gender of the patient, adjusted for all other factors.

Results

There were 1954 children in our cohort, 1287 males and 667 females. When compared between genders, males were given more total pain medication while in the ED even though they did not have a higher pain score (p-value <0.001). More of the males (36% versus 31% for females) received a prescription for take-home pain medication (p-value = 0.022). There was, however, no statistical difference in the time to administration of pain medication between genders.

Conclusions

The results of this study neither prove nor disprove the possibility of gender bias in the pediatric population. It should, however, serve as a reminder for providers to treat each patient equally regardless of gender and do their best to overcome any inherent bias that may affect their practice of medicine.

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High-Dose Intravenous Vitamin C Decreases Rates of Mechanical Ventilation and Cardiac Arrest in Severe COVID-19

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Introduction

Finding a treatment for severe COVID-19 is a top priority worldwide. Intravenous vitamin C (IV-VitC) has been suggested as a treatment for severe sepsis and acute respiratory distress syndrome; however, there are limited studies evaluating its use in severe COVID-19. The goal of this study was to evaluate the efficacy and safety of high-dose IV-VitC (HDIVC) in severe COVID-19.

Methods

This retrospective cohort study occurred from March through July 2020. Inverse probability treatment weighting (IPTW) was utilized to compare outcomes in patients with severe COVID-19 treated with and without HDIVC. This was conducted at a single-center, 530 bed, community teaching hospital. Patients were enrolled utilizing population-based sampling. Those included were older than 18 years of age and were hospitalized secondary to severe COVID-19, indicated by an oxygenation index < 300. The HDIVC treatment course consisted of 3 grams every 6 hours for 7 consecutive days. Primary study outcomes included mortality, mechanical ventilation, intensive care unit (ICU) admission, and cardiac arrest.

Results

A total of 100 patients were enrolled during the study period, with 25 in the HDIVC group and 75 in the control group. The average age was 68 years, and the majority of patients were male (55%) and caucasian (57%). The average time to death was significantly longer for HDIVC patients ($P = 0.0207$), with an average of 22.9 days versus 13.7 days for control patients. Patients who received HDIVC also had significantly lower rates of mechanical ventilation (52.93% vs. 73.14%; ORIPTW = 0.27; $P = 0.0499$) and cardiac arrest (2.46% vs. 9.06%; ORIPTW = 0.23; $P = 0.0439$).

Conclusions

HDIVC may be an effective treatment in decreasing the rates of mechanical ventilation and cardiac arrest in hospitalized patients with severe COVID-19. A longer hospital stay and prolonged time to death may suggest that HDIVC protects against clinical deterioration in severe COVID-19.

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Missed Opportunities for HIV Screening in the Emergency Department

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Introduction

There are 1.1 million people infected with human immunodeficiency virus (HIV) in the United States, and 14% or approximately 170,000 are unaware they are infected. HIV diagnosis is the first step to care and expanded testing is essential to reduce transmission. Individuals with undiagnosed HIV have a transmission rate 3.5 times higher than those aware of their infection. Individuals seeking testing and treatment for sexually transmitted infections (STIs) represent a higher risk population for HIV infection. Despite revised Centers for Disease Control and Prevention (CDC) recommendations to expand HIV testing in healthcare settings, testing remains low. A significant obstacle to expanded testing, especially in emergency departments (EDs), is concern about ensuring appropriate HIV test tracking and follow-up.

Methods

We performed a retrospective chart review of patients presenting with symptoms of an STI between January 1, 2015 and July 8, 2019 at eight Beaumont Health EDs in Southeast Michigan. De-identified data was collected from the electronic health record (EHR) for patients aged 10 and older who had testing for one or more STIs including gonorrhea, syphilis, and chlamydia. Patients were evaluated for concurrent HIV testing during the encounter, and patients known to be HIV infected were excluded.

Results

Of 32,640 encounters during which patients not known to be HIV infected were tested for STIs, only 68 (0.21%) included HIV antibody/antigen screening. Of those tested, only one (1.47%) returned reactive. The remaining 67 screenings returned non-reactive. Applying only 10% of this diagnosis rate to the total number of STI encounters suggests an opportunity to diagnose 47 additional individuals; applying 50% of this rate and the corresponding value is 239 individuals.

Conclusions

These results highlight the need for expanded HIV screening in EDs. Systematic HIV test tracking and follow-up removes this burden from ED providers and enables expanded HIV testing in these settings.

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Assessment of Patient Satisfaction after Mohs Micrographic Surgery

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Introduction

Mohs micrographic surgery is the primary treatment for skin malignancies on the face. Following the procedure, many repair techniques are available for defect closure to restore functional capacity and optimize cosmetic outcome. The PriMatrix graft is a novel fetal bovine acellular dermal matrix scaffold that has been shown to decrease scarring and increase healing in partial and full-thickness wounds. Our primary goal is to assess patient-reported cosmetic and functional outcomes between those who received PriMatrix grafting compared to secondary intention healing. In addition, we will compare patient-reported outcomes with their providers' assessments.

Methods

Patients who received Mohs micrographic surgery at the Rochester Skin Surgery Clinic and subsequent repair using either PriMatrix grafting or healing by secondary intention (SIH) between April 1, 2018 and April 30, 2020 were recruited to our study. Patients and providers completed a questionnaire to assess cosmetic and functional outcomes at the 6- to 8-week postoperative follow-up visit. Chi-squared tests were used to compare patient and provider-reported outcomes.

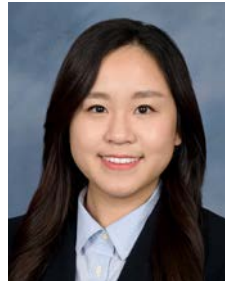
Results

A total of 33 patients enrolled in our study. The majority of our patients were male (55%), non-Hispanic (100%), and Caucasian (100%). Of these patients, 24 (73%) received the PriMatrix Graft, 8 (24%) healed by secondary intention, and 1 (3%) was unknown. The nose (10, 32%) was the most common site of surgery, followed by cheek (7, 22%) and ear (7, 22%). Only 1 patient reported a postoperative complication. All patients reported either good or excellent functional and cosmetic outcome with both repair methods. There was no significant difference between provider and patient evaluation of their cosmetic ($P>0.05$) or functional ($P>0.05$) outcomes between SIH or PriMatrix grafting cohorts.

Conclusions

Patient and provider reported similar functional and cosmetic outcomes for those who healed by secondary intention compared to PriMatrix grafting, with minimal complications.

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Parameters Influencing the Diagnosis and Start of Treatment of Autism Spectrum Disorder

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Introduction

Autism spectrum disorders (ASD) are a spectrum of neurodevelopment disorders defined by repetitive behaviors and deficits in social and communication skills. Most recently, the Centers for Disease Control reported an increase in the prevalence of ASD in eight-year-old children in the United States to be one in 59 in 2014. While the cause of the increase is unclear, efforts have been directed towards creating early identification and early intervention processes to counter this increase. This study will examine different factors influencing the timing of diagnosis and treatment of ASD to further early identification and intervention efforts.

Methods

Parents of children aged between two and seven years with ASD or related conditions served as participants. 19 participants recruited from OUCARES received a recruitment packet with a consent form and survey. The survey evaluated the following factors about their child: race, gender, method of diagnosis, dates of diagnosis/treatment, and use of Approved Autism Evaluation Centers (AAEC). Some participants expanded on their experiences during the diagnostic and treatment processes through an optional interview.

Results

Statistically significant differences were demonstrated in average time to treatment by Race/Ethnicity of the child ($P=0.0041$) and method of diagnosis ($P=0.0092$). No statistically significant differences were found based on type of the first diagnosis or use of Approved Autism Evaluation Centers. Interview data demonstrated that parents found the lack of clear infrastructure in the diagnostic process for their children to be the most challenging but resources from community organizations were helpful.

Conclusions

The results support part of the original hypothesis that Race/Ethnicity and the method of diagnosis play a significant role in the timing of diagnostic and treatment process for child with ASD or other related conditions. It is hoped that these results will continue to motivate researchers to improve our current early identification and intervention methods.

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Incidence and Epidemiology of Marked Leukocytosis in a Pediatric Population

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Introduction

Leukocytosis is a common lab finding associated with diverse etiologies that can range from infection to cancer. The incidence and epidemiology of marked leukocytosis in pediatric populations are not well described in research literature. This study aims to characterize the incidence and etiologies of marked leukocytosis in a pediatric population at Beaumont Children's Hospital in order to identify potential risk factors or trends that can further guide physicians in the evaluation, treatment, and management of patients.

Methods

A retrospective chart review was conducted via the electronic medical record database to identify pediatric patients ≥ 28 days and ≤ 18 years admitted to Beaumont Children's Hospital between 2012-2019 with a first-encounter total White Blood Cell (WBC) count $\geq 30,000$ cells/uL. Patient demographics, etiology, and lab values were collected. Demographics were analyzed against labs and etiologies using logistic regression to determine odds ratio and p-values.

Results

Data collected for 374 pediatric patients demonstrated a mean age of 7 years, 48% females, 63% Caucasians, and 23% African Americans. The most common etiologies were Infection (48%), Malignancy (11%), and Diabetic Ketoacidosis (11%). 28% of patients had accompanying lymphocytosis, 93% neutrophilia, 94% monocytosis, 24% eosinophilia, and 15% basophilia. 89% of patients had elevated CRP, 66% ESR, and 82% procalcitonin. Odds of elevated lymphocytes were 69% less in ages 4-12 compared to <4 ($P < 0.001$). Odds of elevated monocytes were 68% less in ages 12-18 compared to <4 ($P = 0.03$). Ages 12-18 were 2.2 times more likely than those <4 to have basophilia. African Americans were 2.3 times more likely than Caucasians to have eosinophilia.

Conclusions

Characterization of the incidence and etiologies of marked leukocytosis along with identification of potential risk factors and trends based on demographic and clinical factors may assist physicians in more efficiently evaluating, treating, and managing pediatric patients with marked leukocytosis.

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Is Compliance With Positive Airway Pressure Therapy Associated With Weight Change?

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Introduction

Weight loss is considered the best long-term strategy for reducing the severity of obstructive sleep apnea (OSA), a chronic disease for which obesity is the strongest risk factor. Positive airway pressure (PAP) therapy is the gold standard for treating the neurocognitive symptoms of OSA and was long thought to aid in weight loss by correcting the obesity-promoting neurohormonal and metabolic derangements of OSA. Recent studies have called this into question, suggesting that the use of PAP for OSA may actually be associated with weight gain. This retrospective study investigated the association between various patient factors and PAP use, including whether PAP compliance (using PAP > 4 hours/night or > 70% of nights) was associated with weight change.

Methods

Patients diagnosed with OSA and prescribed PAP during a set time period, who followed up with compliance data twice after i PAP, were considered for inclusion. Data was collected from three timepoints (before PAP and the first two visits after PAP) and analyzed by two-sample independent t-tests.

Results

Of the 245 patient records reviewed, only 31 qualified for study inclusion. Analysis revealed no association between PAP compliance and weight change. Younger age at first visit was the only variable associated with weight loss, with an average age of 55.7 years in those who lost weight versus 64.5 years in those who gained weight ($p < 0.05$).

Conclusions

These findings support those of recent studies showing that patients treated with PAP experience no weight change or experience weight gain, rather than weight loss. The key takeaway of this study is that weight loss is more complicated for overweight individuals with OSA than those without OSA. Given the benefits of weight loss in this population, studying the efficacy of comprehensive weight management programs in addition to PAP warrants further exploration.

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Correlating Laparoscopic Tool Pathlength in Peg-Transfer Task with Surgical Residency Education Level

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Introduction

Laparoscopic training has traditionally relied on time metrics to demonstrate competency. Motion-tracking allows for objective measurements to differentiate expert and novice surgeons. This project aims to identify if differences in the pathlength of laparoscopic tools during a simulated peg-transfer task can discriminate between individuals in different surgical residency years.

Methods

General Surgery residents (n=37) completed a peg-transfer task on a custom laparoscopic simulator with motion-tracking capabilities. Pathlength, the total path traced along the simulator's x-axis, includes a sum of right and left laparoscopic tool values. Participant data were sorted into one of three groups according to participant training experience: Group 1- PGY1 and PGY2 participants, Group 2- PGY3 and PGY4 participants, and Group 3- PGY5 and PGY6 participants. Pathlengths were averaged group-wise to relate average pathlength with experience. One-way ANOVA and Tukey's post-test were used to compare average pathlength between groups. Analyses were conducted using the SPSS statistical software package.

Results

There were statistically significant differences in the average pathlength between groups ($p=0.05$). Group 1 (junior residents) average pathlength was significantly longer when compared to Group 2 (215.61 +/- 54.61 vs 161.77 +/- 43.93, $p<0.05$) and Group 3 (215.61 +/- 54.61 vs. 161.05 +/- 49.65, $p<0.05$). There was no significant difference between Group 2 and 3 (161.77 +/- 43.93 vs. 161.05 +/- 49.65, $p=0.999$). Therefore, pathlength is longer for inexperienced residents relative to more experienced trainees.

Conclusions

This study revealed significant differences in average pathlength of junior residents completing peg-transfer tasks when compared to their more experienced peers. Data suggest that tool pathlength during the peg-transfer task plateaus between PGY2 and PGY6 and endures following proficiency attainment. Using this knowledge, pathlength could be pursued as an objective measurement of surgical skill proficiency and employed for the development of a real-time educational feedback device.

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EkoSonic® Endovascular System: A Targeted Therapy for Submassive Pulmonary Embolism

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Introduction

Patients diagnosed with acute pulmonary embolism in the emergency department (ED) are stratified into low, intermediate, and high risk cohorts based upon the extent of hemodynamic compromise and right ventricular (RV) strain (<2%, 15.1%, and 58.3% mortality rate, respectively). While patients with low or high risk have well-defined treatment options, the intermediate risk group, also known as sub-massive PE (SUB-PE), may benefit from more aggressive treatment. Clinical trials performed at large academic institutions have described significant benefit with the use of ultrasound-assisted catheter-directed thrombolysis (UACDT). Our study evaluates the safety, efficacy, and long-term outcomes of treating SUB-PEs with UACDT through a community hospital ED.

Methods

A retrospective observational study of all patients treated for SUB-PE with UACDT at a community hospital ED from May 2015 to April 2018 was conducted. Patients were included if all of the following criteria were met: 1) SUB-PE was diagnosed in the ED, 2) RV strain was identified on echocardiogram (ECHO) and/or CT pulmonary angiography (CT-PA), 3) Cardiac biomarkers were elevated (Troponin and/or BNP), 4) Hemodynamic instability was not present, and 5) UACDT was performed utilizing the EkoSonic® Endovascular System (EKOS). The primary outcome measure was mortality rate. Secondary outcome measures included major/minor bleeding and RV strain. Data was collected utilizing metrics and definitions of prior clinical trials.

Results

A total of 56 patients (mean age 62.7, 66% female) were included, all of which had SUB-PE diagnosed by RV strain identified on CT-PA. RV strain on ECHO decreased from 98.1% to 15.56% following EKOS therapy ($p < 0.0001$). The mortality rate was 7.14% (4/56). One patient had minor bleeding and four patients had major bleeding. There were no incidents of intracranial hemorrhage.

Conclusions

Our study suggests that UACDT can be safely implemented in the community hospital setting, improving the mortality of patients presenting with SUB-PE.

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Deriving Pulmonary Perfusion Images from 4DCT Using Deep Learning

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Introduction

The current standard for ventilation and perfusion imaging, computed tomography (CT) and single photo emission CT (SPECT), is accurate but costly and resource intensive, thus alternative approaches warrant investigation. A deep learning-based perfusion imaging approach, which forgoes the need for SPECT imaging and instead uses 4-dimensional CT (4DCT), could expand the accessibility of functional avoidance radiation therapy for lung cancer patients. Previous literature by Guerrero et al. showed lung mass variation across phases of a 4DCT study can be used to derive pulmonary perfusion during tidal breathing. In this study, we investigate the derivation of SPECT perfusion imaging from only the maximum inhalation and exhalation phases of 4DCT images.

Methods

This retrospective study utilized 27 lung cancer patients, totally 51 time points, who underwent both 4DCT and SPECT/CT imaging sessions at two time points on a clinical trial (R01CA200817). The images from these two modalities were registered using MIM software. Both the CT and SPECT perfusion images were cropped to the lung regions alone. The cropped 4DCT images were used as input and the cropped SPECT perfusion images as ground truth. A deep learning model was trained using 41 imaging studies, and the model performance was tested on 5 cases.

Results

For each of the 5 imaging sessions designated to test the model, gamma analysis (5%, 5mm) and Spearman Rank Correlation Coefficient were computed between the entire SPECT perfusion images and deep learning predictions. The resultant Spearman scores: 0.806, 0.829, 0.726, 0.785, 0.831 and Gamma pass rates: 0.919, 0.916, 0.895, 0.712, 0.723 indicated strong correlation.

Conclusions

Our study yielded the highest quality synthetic perfusion images from 4DCT, outperforming pre-existing mathematical models. The methodology we've developed shows promise for applications in radiation oncology treatment planning, namely avoiding functional lung during radiotherapy delivery.

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Prognostic Significance of Neuroendocrine Differentiation in Prostate Adenocarcinoma with Distant Metastasis

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Introduction

Whole brain radiotherapy (WBRT) is correlated with loss of neurocognitive function due to radiation induced damage to the hippocampus. Hippocampal avoidance (HA)-WBRT has shown to decrease the rate of neurocognitive decline in patients who receive WBRT. Since HA-WBRT traditionally requires MRI for treatment planning, which increases time to delivery and treatment planning complexity, a deep learning model was created to forgo the need for MRI and segment the hippocampus directly from CT images. This study seeks to investigate whether deep learning models, with the creation of an attention gated (AG)-3D ResNet, can delineate or contour the hippocampus on computed tomography (CT) images alone.

Methods

Retrospectively, 390 Gamma Knife patients with both CT and MR images had their hippocampi manually contoured to create the ground truth to train the deep learning model. After CT and MR images were fused, the images were processed with the addition of a body contour, center of mass, and soft-tissue and bone image leveling. Our novel model, the AG-3D ResNet was compared to other deep learning models, including the 3D U-Net, the Dilated 3D U-Net, and the High-Res3DNet. The Dice score and the Hausdorff distance (HD) were used to assess the similarity between the ground truth and each models' predicted left and right hippocampus. Using the RTOG 0933 standard for clinical acceptability, the deep learning contours were compared to physician contours.

Results

The bilateral RTOG passing rate for the AG-3D ResNet was 80.2%, a passing rate comparable to physicians in the RTOG 0933 Phase II clinical trial ($p = 0.3345$). Additionally, the AG-3D ResNet significantly outperformed the other models ($p < 0.05$).

Conclusions

Treatment planning for HA-WBRT with the use of CT and deep learning networks has the potential to increase the quality of life in patients with brain metastases.

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Mapping Level 1 Axillary Nodal Metastases in Patients with Newly Diagnosed Breast Cancer

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Introduction

We examined the distribution of pretreatment nodal metastases to the level I axilla (Ax-L1) to assess the appropriateness of current breast atlases and provide guidelines in relationship to easily identifiable anatomic landmarks for accurate delineation of this lymph node (LN) basin.

Methods

Patients with newly diagnosed breast cancer and biopsy-proven metastatic Ax-L1 LNs were identified. We related the location of each LN to its most adjacent rib and its distance from the bottom of the humeral head, axillary vessels, and a line connecting the anterior aspects of the pectoralis major and latissimus dorsi muscles (P-L line). LNs were mapped onto a representative planning computed tomography scan, and their distribution was used to validate current breast atlases. Furthermore, we examined metastases to a subregion encompassing the superolateral Ax-L1.

Results

We identified 106 eligible patients with 107 biopsied LNs. All LNs fell between the second and fifth ribs (mean, 3.8 ± 0.56). Mean distance from the inferior aspect of the humeral head was 4.3 ± 1.6 cm (range, 0.3 to 8.4). Mean distance from the inferior aspect of the axillary vessels was 2.9 ± 1.5 cm (range, -0.6 to 5.4). Mean distance from the P-L line was 0.01 ± 1.9 cm (range, -2.2 to 2.4); negative and positive values denote medial or lateral to the P-L line. A Radiation Therapy Oncology Group-compliant Ax-L1 consensus contour, created from contours by 4 attending breast radiation oncologists, partially or fully missed 45% of mapped LNs. European Society for Radiotherapy and Oncology- and Radiotherapy Comparative Effectiveness-compliant Ax-L1 similarly missed 46% and 34% of mapped LNs, respectively. LNs were most frequently missed in the lateral direction.

Conclusions

A significant percentage of at-risk Ax-L1 tissue falls outside current contouring atlases. We propose expansion of the recommended Ax-L1 borders, most notably in the lateral direction.

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Prevalence of Head and Neck Injury as Consequence of Intimate Partner Violence

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Introduction

Intimate partner violence (IPV) is an insidious public health crisis. The Centers for Disease Control (CDC) estimates 20% of women experience some manner of physical violence from their intimate partners over their lifetimes. Previous studies on identifying IPV survivors describe characteristic head and neck injuries most commonly associated with this population. Despite the high frequency of IPV, survivors often go unrecognized in emergency departments (ED) while sustaining characteristic injuries of assault. This pilot study quantifies the prevalence of head and neck injuries attributed to IPV in adult, female patients treated at Beaumont Hospital, Royal Oak ED, and describes head and neck injury patterns associated with IPV.

Methods

This is a retrospective chart review of 618 female patients, ages 18 to 45, treated in the ED for head and neck injuries between January 2014 to 2018. International classification of diseases (ICD-10) codes of head and neck injuries were used to extrapolate charts for data analysis. Patient charts were categorized by mechanism of injury due to IPV, motor vehicle accident (MVA) or miscellaneous injury. Chi-Square analysis was used to assess significant association between IPV and characteristics of head and neck injuries. Any P-Value < 0.05 indicates a statistically significant association.

Results

36 of 618 studied patients had head and neck injuries due to IPV. There was a significant correlation between IPV and superficial head injuries, skull and facial bone fractures, eye and orbit injuries as well as superficial neck injuries. It is significantly less common for IPV to be associated with deep neck injuries.

Conclusions

This pilot study quantifies and characterizes head and neck injuries due to IPV in a patient population of Beaumont Hospital, Royal Oak. Future continuation of this study would aid emergency healthcare professionals in better recognizing IPV survivors and serving this patient population according to its needs.

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PPROM and Neonatal Outcomes

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Introduction

Preterm premature rupture of membranes, or PPRM, is a complication occurring in 3% of pregnancies. Approximately 40% of these cases result in preterm delivery and contribute to increased risks of neonatal morbidity and mortality. With improved characterization of the circumstances surrounding PPRM incidence, there may be greater scope for prevention. The primary goal of this study is to determine the association of PPRM with neonatal outcomes (morbidity and mortality).

Methods

Charts for 100 adult patients who gave birth at Beaumont Health System from January 1st 2000 to December 31st 2017 were stratified into PPRM versus no PPRM. Data was collected on neonatal outcome variables including birth weight, NICU stay, and medical complications and analyzed using exact logistic regression and two tailed t-test.

Results

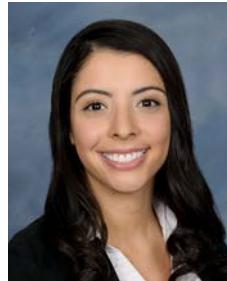
PPROM neonates had lower birth weight compared to control (2413.3 ± 566.3 g vs 3515.7 ± 468.7 g, respectively, $p < 0.001$). PPRM neonates had increased risk of NICU stay (OR=52.7, $p < 0.0001$). PPRM neonates had greater risk of RDS (OR=29, $p < 0.0001$). PPRM neonates had a trend to have greater risk of sepsis (OR=3.2, $p = 0.5$). PPRM neonates had lower gestational age at delivery compared to control (33.8 ± 3.0 weeks vs 39.3 ± 1.4 , respectively, $p < 0.001$).

Conclusions

The results show significant associations between PPRM diagnosis and neonatal NICU stay, lower gestational age, lower birth weight, and RDS. Limitations include small sample size as well as low numbers of neonatal outcome events. More research is needed to delineate the impact of PPRM on neonatal outcomes and long-term health.

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Trochlear Dysplasia: A Systematic Review

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Introduction

Approximately 85% of patients suffering from symptomatic patellar instability showed signs of trochlear dysplasia. There is an association between trochlear dysplasia and patellofemoral instability. The main questions that arise are, what is the normal process of trochlear development and what is the etiology of trochlear dysplasia. Does the literature support an embryological origin of development, or more of an environmental role in the development of trochlear dysplasia? By conducting a thorough qualitative review, the goal is to assemble all current studies and identify whether the majority of the evidence points more towards trochlear dysplasia being genetic in origin or if biomechanical factors play a greater role.

Methods

6 databases were searched from June 2019 to November 2020 (PubMed, Scopus, EMBASE, Cochrane Library, MEDLINE, and Google Scholar). Inclusion criteria included: published after 2010, human subjects, English language, and focusing on trochlear dysplasia. Exclusion criteria included: animal studies, non-scientific/opinion articles, reviews, studies related to imaging criteria and classification only. One independent medical student screened papers following the PRISMA flow diagram, resulting in 16 studies being included for final qualitative synthesis. Thematic synthesis was conducted based on overarching themes shared between the 16 articles.

Results

Study population statistics showed that 54% of participants were female and 46% were males, and 5 out of 13 studies were found to have the average age of participants be between 18-25 years old. 56% of studies used MRI as their imaging modality of choice to assess for trochlear dysplasia. 9 out of 16 studies used Dejour Classification of Trochlear Dysplasia as their criteria for assessing trochlear dysplasia.

Conclusions

Mixture of evidence suggesting both genetic and biomechanical forces as an etiology for trochlear dysplasia. A concise etiology of the development of trochlear dysplasia is still uncertain. More longitudinal studies addressing its development are needed for a more profound understanding.

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Risk of Preterm Birth in IVF Pregnancies with Advanced Maternal Age

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Introduction

Assistive reproductive technology (ART) can be associated with increased risk of preterm birth but it's unclear whether the effects of ART and advanced maternal age (AMA) are additive risks. Prior studies have showed that ART in the AMA population increased risk of preterm delivery, therefore our current study aimed to quantify and assess the risks of preterm birth for in vitro fertilization (IVF) in AMA pregnancies using both autologous and donor eggs by controlling for a prior history of preterm delivery.

Methods

This study was a retrospective chart review spanning from January 2004 – January 2016. The inclusion criteria were women who were forty years or older at the time of their pregnancy and delivered within our hospital system. Women who had IVF treatment using autologous or donor eggs and those who conceived spontaneously were included. Adverse prenatal outcomes were compared.

Results

Women who had IVF treatment had more than 2-fold increased risk of spontaneous preterm birth compared to spontaneous pregnancies after adjusting for prior history of preterm birth ($p < 0.05$). IVF pregnancies had higher rates of hypertensive disorders of pregnancy and intrauterine growth restriction, and lower rates of vaginal birth than spontaneous pregnancies ($p < 0.05$). Within IVF pregnancies, there were no significant differences between autologous and donor egg pregnancies.

Conclusions

Consistent with existing literature, our results suggest that AMA patients who have IVF therapy have an increased risk of preterm birth compared to spontaneous pregnancies even when adjusted for a prior history of preterm birth.

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Incidence and Downstream Effect of Guideline Non-adherence: HEART Score in Community Hospital ED Setting

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Introduction

Overutilization of hospital resources in low risk chest pain patients (LOWCPs) has been addressed in multiple previous studies, showing accelerated diagnostic protocols significantly improve utilization of resources. Unfortunately, the gap between guideline development in academic centers and guideline adherence in community hospitals remains difficult to bridge. Our study aimed to describe the incidence and downstream effect of guideline non-adherence for LOWCPs in our community hospital emergency department observation unit (EDOU) with a HEART score < 4.

Methods

We performed a retrospective observational study of patients placed in our EDOU for acute coronary syndrome evaluation. LOWCPs were included if initial emergency department work-up was negative. Trained research associates utilizing a structured data extraction template collected patient information to calculate a HEART score. Patients were then stratified into: 1) HEART score < 4 (LOW) and 2) HEART score >4 (HIGH). Our primary outcome measure was the incidence of guideline non-adherence, defined by LOWCPs in LOW transferred to the EDOU. Secondary outcomes included HIGH vs. LOW: 1) incidence of “abnormal” provocative testing defined by presence of > “moderate” coronary stenosis”, 2) incidence of NSTEMI, 3) 30-day ED return rate. Data analyzed using descriptive statistics and the chi-square test for significance of categorical variables.

Results

149 patients total (mean age 52.4 years, 56.4% female) met inclusion criteria. 75 (50.34%) were in LOW, while 74 (49.66%) patients in HIGH cohort. 144 (96.64%) had stress testing and/or CT coronary angiography. Of these patients, nine (6.12%) had “abnormal” results. One patient in LOW, and eight patients in HIGH cohort had “abnormal” results ($p = 0.0151$). No difference in NSTEMI or 30-day ED return rates between LOW vs. HIGH.

Conclusions

Guideline non-adherence with the HEART score resulted in twice the number of patients undergoing urgent provocative testing with a significantly lower proportion having “abnormal” findings.

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Perceptions of Physician-Patient Relationship Among Behavioral Health Patients Through a Race/Ethnicity Lens

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Introduction

There is limited research on the influence of race/ethnicity on the physician-patient relationship when behavioral health physicians are of color. This research evaluates the effect of racial/ethnic concordance and time under care on the physician-patient relationship, achieved through survey evaluation of patient satisfaction. It is hypothesized that a shared background and longer relationship with a physician increases satisfaction in patients of color when compared to patients not of color.

Methods

A questionnaire was administered at a mental health clinic in Detroit. For one month, office staff distributed surveys to patients which were returned to a drop-box. Surveys collected demographic information and used Likert-scale items to gauge satisfaction. A Two-sample t-test or Fishers Exact test compared results between patients of color vs. patients not of color who were treated by physicians of color, as well as time under care (< 6 months vs. > 6 months).

Results

54 patients completed the survey, 75% were African American, and 60% had time under care of 6 months or more. There were no statistically significant differences in overall satisfaction or comfort with physicians based on race/ethnicity or time under care ($p>0.05$).

Conclusions

The results do not support the hypothesis, but there are several potential explanations including small sample size, recruitment methods, and patient characteristics. Having researchers on-site will increase recruitment. In addition, it is likely that satisfied patients participated, and that non-African American patients did not feel discomfort with a racially/ethnically discordant patient-physician relationship. Future research should include non-African American physicians to study this.

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Left Ventricular Diastolic Function Improvement One Year After Transcatheter Aortic Valve Replacement for Severe Aortic Stenosis

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Introduction

Long term outcomes in diastolic dysfunction (DD) after transcatheter aortic valve replacement (TAVR) for severe aortic stenosis (AS) remains controversial. The aim of this study is to determine changes in DD in severe AS patients before and 1-year after TAVR.

Methods

A retrospective study was conducted for 284 patients who underwent TAVR at Beaumont Hospital (2015-2018). We collected patient demographics, comorbidities, echocardiographic data, and DD grades; we excluded patients with incomplete data. Baseline pre-procedure data were compared with 1-year follow-up. DD parameters of left ventricular ejections fraction (LVEF), E-wave, E/A ratio, E/e' lateral and septal e', left atrial volume index (LAVI), tricuspid regurgitation peak velocity (TR Pk Vel), and aortic mean gradient were obtained. Descriptive statistics, multivariate analysis, and independent T-tests were used.

Results

249 patients were included in the final analysis. At 1-year post-TAVR, there were significant increases in LVEF in Grades 2 and 3, LAVI in Grades 1 and 3, and TR peak velocity in all Grades. Grade 3 demonstrated the most significant improvement in diastolic parameters especially E/A ratio and E velocity. Moreover, there was a significant decrease in the incidence of Grade 2 and 3 with a resultant increase in normal and Grade 1.

Conclusions

There were significant improvements in the LVEF, LAVI, diastolic parameters, and diastolic function grading at 1-year. Most improvement was noted in advanced grades of DD.

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Opportunities for Lifestyle Intervention at a Suburban Family Medicine Center: A Needs Assessment

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Introduction

It is well established that healthy diet, physical activity, and even moderate weight reduction can reduce chronic disease risk. There is great potential to intervene on these modifiable risk factors in the primary care setting, as primary care is considered central in the management of chronic disease. However, providers often feel limited in their ability to deliver population-based lifestyle intervention tailored to their patients' needs. The primary goal of this study is to identify current eating and exercise behaviors and barriers to change in the patient population served by the Beaumont Troy Family Medicine Center (FMC), in hopes of identifying opportunities for intervention. A secondary goal is to determine whether intervention targets should differ based on weight status.

Methods

A four-page, evidence-based needs assessment was created to assess current health behaviors, self-efficacy, and barriers to change in the Beaumont Troy FMC patient population. 1,137 surveys were administered by registration staff over four months and completed by patients at the time of their appointment.

Results

74.6% and 80.3% of patients reported plans to improve eating and exercise behaviors, respectively, over the next six months. Patients self-classified as overweight or obese were more likely to endorse that they "want to" and "should" improve behaviors ($p < 0.001$), but not that they were "able to" ($p = 0.128$). Overweight or obese patients were more likely to report unhealthy portion sizes and little to no physical activity ($p < 0.001$). In terms of barriers to change, overweight or obese patients were more likely to endorse "lack of motivation" as most significant, while those of normal weight selected "not enough time".

Conclusions

Opportunity exists for population-based lifestyle intervention at this suburban FMC, particularly in regards to enhancing motivation to change. The results support the hypothesis that barriers to improved health behaviors differ by weight status, suggesting a potential benefit to alternative intervention targets.

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Predictors of Sensorineural Hearing Loss in Pediatric Bacterial Meningitis: A Systematic Review

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Introduction

Sensorineural hearing loss (SNHL) is a potential consequence of bacterial meningitis (BM) in pediatric populations. This project aims to synthesize the effect sizes of epidemiological, clinical, and therapeutic risk factors in the development of SNHL in pediatric BM through a systematic review of the literature.

Methods

A search of PubMed and EMBASE was conducted for primary studies reporting frequencies of SNHL across risk factors or treatments in pediatric patients (from birth until seventeen years) diagnosed with BM and no previous known neurological or otologic pathology. Odd ratios and their 95% CI were calculated from the frequencies reported in the studies reviewed. Pooled OR and CIs were calculated for factors reported in multiple studies under a fixed effects model using the inverse-variance method.

Results

471 articles were identified and 27 met inclusion and exclusion criteria. Treatment with dexamethasone (0.48, 0.34-0.69) was associated with decreased development of SNHL. Cases with *Streptococcus pneumoniae* as causative organism were associated with increased odds of SNHL (2.38, 1.85-3.06) in pediatric patients. No other treatment modalities had a significant effect on presence of SNHL.

Conclusions

Use of dexamethasone may lead to decreased likelihood of SNHL in pediatric patients with BM, while infection with *S. pneumoniae* may increase the likelihood of SNHL. Identification of these risk factors during acute presentation may facilitate active follow-up with audiologic assessment and earlier intervention if needed.

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Effectiveness of Resistance Training and Associated Program Characteristics in Patients at Risk for Type 2 Diabetes: a Systematic Review and Meta-Analysis

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Introduction

Resistance training (RT) is an effective intervention for glycemic control and cardiometabolic health in individuals with type 2 diabetes (T2D). However, the use of RT in individuals at risk for T2D to prevent or delay the onset of T2D, and RT program characteristics that are most effective are still unknown. The purpose of this review is to determine the effects of RT on cardiometabolic risk factors in those at risk for T2D, and to examine RT program characteristics associated with intervention effectiveness.

Methods

A systematic review and meta-analysis was conducted to determine the effect of RT on glycosylated hemoglobin (HbA1c), fasting plasma glucose (FPG), body fat percentage (BF%), total cholesterol (TC), high density lipoprotein (HDL), low density lipoprotein (LDL), and triglycerides (TG). Additional analyses examined effects of intervention duration and dietary intervention on FPG and TG.

Results

Fourteen trials with 668 participants were included. For RT compared to controls, the standardized mean difference (SMD) was -1.064 for HbA1c (95% confidence interval [CI] -1.802 to -0.327; $p=0.005$), -0.99 for FPG (95% CI -1.798 to -0.183; $p=0.016$), -0.933 for TC (95% CI -1.66 to -0.206; $p=0.012$), -0.840 for BF% (95% CI -1.429 to -0.251; $p=0.005$), -0.693 for HDL (95% CI -1.230 to -0.156; $p=0.011$), -1.03 for LDL (95% CI -2.03 to -0.050; $p=0.039$), and -0.705 for TG (95% CI -1.132 to -0.279; $p=0.001$).

Conclusions

RT is beneficial for improving glycemic control, BF%, and blood lipids in those at risk for diabetes. Thus, RT may be an effective intervention for delaying or preventing the onset of T2D, and can be recommended by clinicians to those at risk for T2D to improve cardiometabolic outcomes. The addition of a dietary component did not result in larger reductions in FPG and TG than RT alone.

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Radiofrequency Ablation and Vertebroplasty For Treatment of Metastatic breast Cancer Spinal Fractures

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Introduction

Approximately 30% of all cancer patients develop spinal metastases. These lesions can result in pathologic vertebral compression fractures, which can lead to pain and neurological deficits. When a symptomatic compression fracture occurs without associated deformity or neurological deficit, these fractures can be treated with vertebroplasty/kyphoplasty with or without radiofrequency ablation (RFA). Treatment with vertebroplasty is well-established for these patients, but does nothing to address the oncologic disease. This research evaluates the efficacy of concomitant radiofrequency ablation with kyphoplasty for the treatment of spinal fractures secondary to breast cancer metastases.

Methods

Retrospective medical chart analysis of breast cancer patients with metastatic spinal fractures who underwent RFA and kyphoplasty was undertaken (n=23). Key variables of interest include: fracture location, pain levels, and local recurrence. Local recurrence data was compared to published rates of recurrence in breast cancer related metastatic spinal fractures treated with vertebroplasty/kyphoplasty alone. Data was analyzed using chi-square and t-test statistical analyses.

Results

The mean preoperative pain level for this cohort was 6.55 on a 10-point VAS scale. Significant reductions in pain levels were observed postoperatively, both at discharge (3.50; $p < 0.05$) and at 1-month follow-up (3.07; $p < 0.05$). Compared with published data of breast cancer patients with metastatic spinal fractures treated with vertebroplasty alone, the addition of RFA resulted in reduced local tumor recurrence (2% vs 14%; $p < 0.05$). Average length of follow-up was 22 months.

Conclusions

The results suggest that the addition of RFA to standard vertebroplasty/kyphoplasty reduces local tumor recurrence while providing the same benefits in terms of pain relief. This supports the hypothesis that this procedure provides additional benefits compared to vertebroplasty/kyphoplasty alone for this patient population. The extrapolation of this added benefit for the treatment of pathological fractures secondary to other metastases from other primary cancer pathologies should be examined in future studies.

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Intravitreal Thrombolytics as a Novel Treatment Option for Central Retinal Vein Occlusions

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Introduction

Retinal Vein Occlusion (RVO) is a retinal vascular disease that can lead to loss of vision due to macular edema, retinal ischemia, neovascularization and hemorrhage. Affecting an estimated 16.4 million people worldwide, RVO is the second most common retinal vascular disease after diabetic retinopathy. This study focuses on Central Retinal Vein Occlusion (CRVO), for which there is no cure. Current standard of care includes intravitreal anti-VEGF or corticosteroids. The standard treatment often requires frequent injections over extended periods of time and only targets secondary disease effects. Intravitreal thrombolytics have been identified as another potential treatment option that would directly address the disease etiology. This study compares treatment outcomes of CRVO patients treated with intravitreal thrombolytics with or without anti-VEGF or corticosteroids versus treatment with anti-VEGF or corticosteroid monotherapy.

Methods

This study is a retrospective chart review of CRVO patients treated at Associated Retinal Consultants. Changes in visual acuity (VA) and number of injections overtime were recorded and compared between treatment groups. Analysis of VA changes was performed using a two sample independent t-test and time variations were controlled for using a linear regression. Number of injections were compared using a negative binominal model. The biggest limitation was the low number of patients in the thrombolytic treatment group.

Results

VA and number of required injections over one year were not significantly different between the thrombolytic and standard treatment groups (all $P > 0.05$).

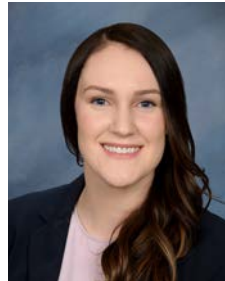
Conclusions

Given the limitations of this study, more data is required to determine if patients receiving intravitreal thrombolytics exhibit a greater improvement in visual acuity and require fewer injections compared to patients who were treated with anti-VEGF or corticosteroid monotherapy. Improved study design and evidence of improved treatment outcomes using thrombolytic therapy could lead to improved patient care and support the development of a controlled, randomized study.

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Comparing Breast Cancer Biomarkers Between Initial Core Needle Biopsy/Lumpectomy Specimens and Subsequent Cutaneous Metastases

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Introduction

A core needle biopsy is indispensable to guiding breast cancer treatment decisions by providing histology and biomarker expression. The clinical significance of recurrent biomarker testing has not been thoroughly studied in the evaluation of cutaneous metastatic breast carcinoma after the testing of initial core biopsy/lumpectomy specimens. This study seeks to compare core biopsy/lumpectomy data with cutaneous metastatic deposits of breast cancer using archival material to determine the concordance among biomarker profiles. This study will compare estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2). These biomarkers have prognostic value, and some are targeted for therapy, which impacts treatment options for patients. While biomarker tests are often routinely performed on cutaneous metastases, this research aims to better understand the clinical impact of repeat testing and lend evidence to support these practices.

Methods

Patients with a breast core biopsy/lumpectomy specimen and subsequent biopsies of cutaneous metastatic deposits of breast cancer were selected from the pathology database for this retrospective study. The electronic medical records were then used to collect patient data on the ER, PR, and HER2 status of the specimens. Kappa statistics were used for analysis.

Results

The biomarker status of breast core needle biopsy/lumpectomy and subsequent cutaneous metastatic deposits of breast cancer remained consistent for many patients in our study. ER, and PR status did not change in 61.9% of patients (13/21), while HER2 status more often remained consistent with no change in HER2 immunohistochemistry in 90% of patients (18/20) and no change in HER2 FISH in 94.12% of patients (16/17).

Conclusions

This study's findings may impact how hospitals assess the need for subsequent testing of biomarker profile status in cutaneous metastases. Our data suggest that repeat testing of some routinely used biomarkers may not be justified in all cases.

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Preterm Premature Rupture of Membranes: Maternal Characteristics

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Introduction

Preterm Premature Rupture of Membranes (PPROM) has proven to be a daily obstacle for obstetricians. There are several contributing risk factors in literature associated with PPRM, but the etiology is not fully understood. Expanding the knowledge of PPRM, could be an essential tool in estimating the incidence and prevalence of PPRM. This study examines the association of PPRM with multiple maternal characteristics among pregnant women at Beaumont Health system.

Methods

A retrospective case-control chart review using patients with PPRM at Beaumont Hospital, Royal Oak between January 1st 2000 to December 31st 2017. Participants included 200 adult female patients 18 to 50 years of age, stratified on the basis of a PPRM diagnosis versus no PPRM diagnosis. Data was collected on various maternal characteristics and subjected to logistic regression for probable associations of certain maternal characteristics with PROM diagnoses.

Results

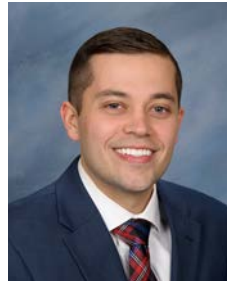
Medical-related disorders such as endocrine disorders, psychological diagnoses, asthma, and autoimmune diseases were seen significantly more in PPRM cases compared to controls (OR=3.6, $p<0.001$). Pregnancy-related disorders such as gestational hypertension, uterine and cervix abnormalities, gestational diabetes mellitus, and umbilical cord abnormalities were seen significantly more in PPRM cases compared to controls (OR=2.1, $p=0.04$). Our results also found placental abnormalities were seen less in PPRM cases compared to controls (OR=0.1, $p<0.001$). STD diagnoses was more common in PPRM cases compared to controls (OR=3.9, $p=0.010$). Maternal age was significantly different between PPRM cases and controls (32.4 vs 29.9 years, respectively, OR= 1.1, $p<0.001$).

Conclusions

The results showed a significant association between PPRM diagnosis with STD diagnosis, maternal medical disorders, maternal age, and pregnancy-related disorders. Patients with placental abnormalities were less likely to develop PPRM. Limitations include a small sample size.

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Contributing Factors to Knee Osteochondritis Dissecans Lesion Instability

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Introduction

Osteochondritis dissecans (OCD) is an idiopathic disorder affecting subchondral bone and its overlying articular cartilage. OCD lesions are problematic because they cause prolonged pain, and if untreated can develop into osteoarthritis. The primary goal of our study was to discover who was most vulnerable to developing unstable knee OCDs. Secondly, we aim to discover the treatments chosen for unstable lesions.

Methods

A retrospective chart review was designed to evaluate records of patients presenting to Beaumont Hospitals with a knee OCD lesion between January 2007 and December 2017. Data gathered included sex, knee affected, lesion size, location, treatment provided, and stability. Lesion stability was determined by MRI and/or arthroscopic findings. A repeated measures logistic regression analysis was performed to determine any relationships causing greater instability of OCD lesions.

Results

From January 2007 to December 2017, 239 patients presented to Beaumont Hospitals with knee OCD. Average age was 22 and median age was 17. Ages were evaluated in groups, 9-19 (61.9%), 20-29 (11.7%), 30-39 (14.2%), and 40-50 (12.1%). Lesion size and location had no relationship with stability. Age did have an association with increased instability: 20-29 (OR=3.03, $p=0.021$), 30-39 (OR=2.18, $p=0.033$), 40-50 (OR=9.54, $p<0.001$). Patients with unstable lesions were more likely to receive microfracture (OR=4.05, $p<0.001$) and allograft (OR=24.45, $p=0.003$) than patients with a stable lesion. However, patients with unstable lesions were less likely to receive retrograde drilling (OR=0.15, $p=0.004$), antegrade drilling (OR=0.25, $p<0.001$), or conservative treatment (OR=0.25, $p<0.001$) than patients with a stable lesion.

Conclusions

Knee OCDs are musculoskeletal injuries that commonly affect teenagers. When people develop a knee OCD from age 20-50, the odds of having an unstable lesion increase. We determined patients undergoing surgery for an unstable OCD lesion received more invasive and complicated surgeries, such as microfracture and osteochondral allograft transplantation, rather than more conservative interventions, retrograde drilling, and antegrade drilling.

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Presentation and Outcomes of Chronic Rhinosinusitis Following Liver and Kidney Transplant

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Introduction

Otolaryngologists are increasingly managing diseases of the head and neck in populations of immunocompromised patients. This study aims to describe presenting characteristics of patients diagnosed with non-invasive chronic rhinosinusitis (CRS) following liver or kidney transplant and determine factors associated with disease-related complications, selection of endoscopic sinus surgery (ESS), and disease resolution in this population.

Methods

This study was a retrospective chart review performed at an academic tertiary care center (Mayo Clinic, Rochester, Minnesota). Liver and kidney transplant recipients evaluated by otolaryngologists for CRS between 1998 and 2018 were identified. Univariate and multivariate logistic regression analyses were used to determine patient factors and treatment modalities associated with developing complications, selection of ESS, and disease resolution.

Results

Fifty-seven patients met inclusion criteria. No patients developed intraorbital or intracranial complications of their CRS. Multivariate modeling demonstrated that the presence of polyps ($P = 0.036$) was associated with undergoing ESS within one year of presentation. A higher Lund–Mackay (LM) computed tomography score ($P = 0.023$) and older age ($P = 0.018$) were significantly associated with decreased disease resolution. No other factors were significantly associated with the use of endoscopic sinus surgery within one year of otolaryngology presentation or resolution of CRS in this cohort.

Conclusions

The risk of developing CRS-related intraorbital or intracranial complications in this immunocompromised patient cohort may be lower than originally thought. For liver- and kidney-recipients stable on immunosuppressive medication for many years, prognostic factors for CRS may mirror those for immunocompetent patients.

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Single Institution Analysis of Ablations vs Partial Nephrectomies for Small Renal Masses

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Introduction

Renal cell carcinoma (RCC) has the highest rate of mortality of genitourinary malignancies, with detection rising annually for small (<4cm) renal masses (SRM). This study evaluated the outcomes and costs associated with treating SRM RCC through the currently recommended partial nephrectomy (PN) or ablative techniques: laparoscopic cryo- (lcryo), percutaneous cryo- (pcryo), microwave (pmv), and radiofrequency (prf).

Methods

A retrospective chart review of 295 PN or Abl patients from 2010-2019 at Beaumont Hospital was performed with 189 SRM patients analyzed. Data collected included demographics, comorbidities, pathology, 30-day readmission, recurrence rate, and hospital-billed costs and charges.

Results

133 patients with an Abl (6 lcryo, 73 pcryo, 44 pmv, and 10 prf) and 56 patients with a PN were analyzed. Populations were similar for both demographics and comorbidities including mean tumor size (Abl 2.34cm, PN 2.48cm) except for age at index procedure (PN 58, Abl 71, $p<0.01$) and length of stay (PN = 2.74 days, Abl LOS 0.52, $p<0.01$). Total hospital-charge analysis showed PN was 1.57x the Abl ($p<0.01$) while PN was more costly than Abl by 2.79x ($p<0.01$). Trends showed percutaneous interventions had a lower charge and cost when compared to both PN and lcryo.

Conclusions

While treatment decisions for SRM RCC are multifactorial, this study demonstrated similar populations with comparable pathology undergo both PN and Abl procedures. Consideration should be given to differing complication and readmission rates and costs when managing SRM RCC.

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Meniscal Repair Trends at William Beaumont Hospital – A Longitudinal Review

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Introduction

Meniscal injuries are one of the most common injuries evaluated by orthopedic surgeons. Preservation of meniscal function is the main goal of meniscal surgery due to the numerous biomechanical roles that it plays in shock absorption and load distribution across the knee. Some of the current treatment options include a nonoperative approach, meniscectomy, or meniscal repair. This longitudinal study seeks to analyze the current trends of practice in arthroscopic meniscal treatment and the variables that may factor into the decision-making process.

Methods

This is a retrospective cohort study that will be looking at patients from Beaumont Hospital, Royal Oak that have had a meniscal repair or a meniscectomy between 7/1/2012 and 12/31/2016. Each cohort will be divided and evaluated for their trends across a variety of variables, from the patient's age, sex, type of meniscus tear, location of meniscus tear, meniscal procedure performed, and the year of their procedure. A log-linear trend model and Cochran-Armitage Tests for Trend will be used to analyze the collected results.

Results

Out of the 4,847 patients enrolled in the study, 4,735 patients had a meniscectomy, while only 112 patients had a meniscus repair. The proportion of meniscectomies was highest in patients between the ages of 41-50 and 51-60, accounting for 22.8% and 29.6% of all meniscectomies performed. On the other hand, rates of meniscus repairs were highest in patients between the ages of 0-20 and 21-30, accounting for 46.4% and 30.4% of all meniscus repairs performed.

Conclusions

Meniscectomies have remained the procedure of choice for patients with meniscus injuries at Beaumont Hospital, Royal Oak, despite recent advancements in meniscal repair techniques. Meniscectomies were more common in middle-aged and older patients, while meniscus repairs were more prevalent in adolescents and young adults, highlighting the goal of meniscus preservation for the prevention of early osteoarthritis.

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Efficacy and Durability of Transpedicular Vertebrectomy with Short Segment Instrumentation for the Treatment of Thoracic Spinal Metastases

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Introduction

Current treatment of spinal metastases requiring vertebrectomy entails pedicle screw fixation at least two levels above and below the level of reconstruction. We evaluated the safety, durability, and efficacy of an alternative method via short segment instrumentation after posterior transpedicular vertebrectomy and reconstruction with pedicle screw fixation at only one level above and below.

Methods

We conducted a retrospective cohort study of patients ($n = 30$) treated for thoracic spinal metastasis via vertebrectomy with short segment instrumentation. We also conducted a review of 15 articles detailing patients ($n = 316$) treated with standard long segment instrumentation and reconstruction.

Results

The short segment cohort had less intraoperative blood loss (668.33 mL versus 1696.89 mL, $p < 0.001$) and a comparable number of perioperative complications (6.67% versus 16.23%, $p = 0.17$), despite an older cohort and a higher proportion of patients receiving postoperative radiation (66.67% versus 38.10%, $p = 0.006$). Operative time, duration of stay, and postoperative pain scores were not statistically different. The short segment cohort had a comparable rate of local recurrence (10% versus 6.19%, $p = 0.47$) despite a greater proportion of patients with radioresistant tumor pathology. There was no construct failure or need for revision surgery at any time during the follow-up period in the short segment cohort. Average length of follow-up was 15 months (range 1- 65 months).

Conclusions

Our results encourage consideration of this less invasive technique in the management of patients suffering from metastatic disease requiring vertebrectomy and reconstruction.

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Cytologic Evaluation of 200 Consecutive Bronchoalveolar Lavage Specimens With Grocott's Methenamine Silver Stain and Correlation With Microbiologic Studies

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Introduction

Cytologic examination and microbiologic testing of bronchoalveolar lavage (BAL) specimens are important in the diagnosis and treatment of pulmonary infections. We investigated the value of cytomorphologic findings, including Grocott's methenamine silver (GMS) stain, relative to concurrent fungal cultures.

Methods

Blinded to clinical and microbiologic data, three authors examined Papanicolaou- and GMS-stained slides from 200 consecutive BALs from 186 patients. Another author examined clinical and microbiologic data while blinded to the cytologic findings. Fungal culture results were considered the gold standard for the presence or absence of fungus.

Results

132 smears (SM) and 68 Cytospin (CS) preparations were examined. When any of the three examiners identified any amount of fungal organisms, sensitivity of 56.7% and positive predictive value (PPV) of 47.2% were found. Sensitivity decreased to 41.7%, while PPV increased to 61.0% when all three examiners agreed on any fungal presence. A negative GMS by all examiners correlated to specificity of 72.9% and negative predictive value (NPV) of 79.7%.

The most common indications for bronchoscopy and BAL were radiologic infiltrate, abnormal imaging, atelectasis, cough, and lung mass. Sixty BAL samples resulted in positive fungal cultures, while the remaining 140 cultures were negative.

Conclusions

Examining BAL specimens for fungal organisms with GMS provides good PPV but poor NPV on smears when fungal organisms are identified. On Cytospin, NPV is high for all FHPF+ cutoffs, but PPV is poor. Though there may be value in performing GMS and quantifying the amount of fungal organisms in some cases, poor sensitivity and specificity do not support this practice on all BAL specimens. If fungal organisms are found, qualitative reporting of the amount of fungal organisms identified (rare, moderate, numerous) on GMS may provide some value.

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Improving Survival Outcomes in Limited-stage Small-Cell Lung Cancer Patients Using Simultaneous-Integrated Boost Intensity-Modulated Radiation Therapy (SIB-IMRT)

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Introduction

Limited-stage small-cell lung cancer (LS-SCLC) is potentially curative for 20-30% of patients with concurrent chemotherapy and thoracic radiation. The goal of radiation therapy is to maximize the dose to the target area, while minimizing toxicity to peripheral organs, however the optimal radiotherapy treatment for LS-SCLC is still highly debated. This retrospective study examines survival outcomes in LS-SCLC patients who have received one of three radiotherapy treatments. The conventional dose-escalated schedule delivers 2 Gy daily in 30 fractions. The accelerated hyper-fractionated model delivers 1.5 Gy twice per day in 30 fractions to the target area. Lastly, the third method known as Simultaneous Integrated Boost Intensity-modulated radiation therapy (SIB-IMRT), utilizes FDG-PET imaging to identify areas of nodal disease to reduce the volume of normal tissue receiving medium to high doses of radiation. We hypothesized that LS-SCLC patients receiving SIB-IMRT treatment will have the best survival outcomes.

Methods

With IRB approval, 77 patients treated for LS-SCLC between January 2007 and December 2017 were selected from the departmental HIPAA compliant lung database 2008-283 on the Beaumont campus. All variables of interest were collected and transferred to the secure SharePoint database. Survival Outcomes following either the 70/60 SIB-IMRT or 45 Gy BID treatment were measured using the Kaplan-Meier method Actuarial Survival Estimates and Log-Rank Tests. In addition, Kaplan-Meier Curves were generated for these outcomes. All analysis was done using SAS 9.4 (SAS Institute Inc., Cary, NC, USA).

Results

Compared to the control group, the 45 Gy BID group and the 70/60 SIB-IMRT group did not demonstrate a statistically significant difference in overall survival ($p=0.3736$).

Conclusions

Limited-stage small-cell lung cancer patients receiving the 70/60 SIB-IMRT treatment did not demonstrate higher survival outcomes compared to current treatment standards, suggesting that incorporating FDG-PET in radiotherapy may not help optimize treatment in LS-SCLC patients.

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General Trends in Opioid Prescription in Children Admitted to Beaumont Pediatrics Emergency Care

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Introduction

Opioid misuse has become a major public health issue in the United States. Opioids are frequently prescribed to patients during emergency care (EC) visits and upon discharge in order to manage pain. Historically, pain in pediatric EC patients has been poorly understood and assessed. Recent studies have shown that there has been an increase in opioid usage in strides toward improving pain management in pediatric EC patients. In light of increasing concern for opioid misuse, this study hopes to understand if there has been an increase in the opioid usage trends in the Beaumont Pediatrics EC.

Methods

The study was a retrospective study using a convenience sample from Pediatric EC patients. The data from the pediatric patients of age 0 to 18 who were admitted to Beaumont Pediatrics EC for any pain-related visits from December 2010 through December 2018 was obtained from the electronic medical record. The percentages of the patient who received opioids were plotted over the time to assess the overall trend in percent changes.

Results

There was a significant 10-year decrease of 0.6% in overall opioid prescriptions in pediatric patients admitted to Beaumont EC for pain-related visits (P-value < 0.001). Codeine had the greatest decrease in prescriptions with 0.03% (P-value < 0.001). Hydrocodone had the next greatest decrease in prescription with 0.006% (P-value = 0.002). Both Oxycodone and Tramadol had percent decrease of 0.0005% (P = 0.042, P = 0.038).

Conclusions

Contrary to the hypothesis, there was a decreasing trend of opioid prescriptions to pediatrics patients admitted to Beaumont Pediatrics EC for any pain related visits. There has been a significant decrease in codeine, Hydrocodone, Oxycodone, and Tramadol prescriptions. This study hopes to serve Beaumont physicians as a basis in continued efforts in safe opioid prescribing practices.

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Sex Differences in Sensitivity to Teratogenic Alcohol Exposure: Multiple Memory Systems Assessment

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Introduction

Alcohol is a teratogen causes detrimental effects to unborn children when consumed during pregnancy. The consequences associated with prenatal alcohol exposure (PAE) occur on a continuum including craniofacial abnormalities, delayed growth, behavior changes, and mental or developmental disabilities. Although animal studies have investigated overall effects of PAE, its effects as a function of sex have not been well explored. This study explores the sex-dependent effects of PAE by comparing littermates of dams exposed to nonalcohol and “moderate alcohol” conditions.

Methods

Pups born from dams that consumed a 10%(v/v) alcohol solution during gestation were assigned to the Prenatal Alcohol Exposure (PAE) condition, whereas pups from dams that consumed a vehicle solution were assigned to the control condition. This procedure models alcohol exposure during the first two trimesters of a human pregnancy. After weaning, pups underwent testing to assess differences between PAE males and females. Y-maze testing, fear conditioning, novel object recognition (NOR), and novel location recognition (NLR) were used to assess spatial memory, and emotional memory, and object memory respectively.

Results

Alcohol did not have a significant effect on the memory systems tested, regardless of sex. Memory testing with the Y-maze ($p = 0.54, 0.19$), NOR and NLR, ($p = 0.63$), and fear conditioning ($p = 0.75$) were not significant.

Conclusions

With the current procedure, the teratogenic effects of alcohol on different memory systems do not vary as a result of sex. PAE did not have significant effects on spatial, object, or emotional memory in male or female pups. This study was limited by varying weights of dams and low alcohol consumption during pregnancy. This may be addressed in future studies by increasing sweetness to encourage drinking. This research increased our current understanding of the sex-dependent effects of PAE and can serve as a foundation for future studies.

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The Effect of Different Auditory Stimuli on Laparoscopic Skill Acquisition

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Introduction

Literature suggests that listening to music decreases the time required for a surgeon to perform surgical skills, and improves their overall performance. However, little is known about how music affects a surgeon's performance of a novel skill. This study sought to explore how different auditory conditions impact the performance of the intracorporeal knot.

Methods

Participants (n=45) were medical students, naïve to the intracorporeal knot. A pre-test assessed baseline cognitive performance with, and without music. This served to stratify individuals into two groups: those whose performance thrives, or declines, while listening to music. An equal proportion of individuals from each group were randomly assigned to one of four auditory training conditions: participant-preferred music, randomized music, ambient noise, and silence. Participants watched an instructional video on intracorporeal knot technique and had 80 minutes to practice under their assigned auditory condition. Proficiency was defined by the Fundamentals of Laparoscopic Surgery as an attempt spanning less than 112 seconds, with no knots occurring outside of 1mm. Average completion time was measured for each group for comparison using Analysis of Variance.

Results

The average time to task completion was significantly different between the groups. The Ambient Noise group completed the task significantly quicker than the Randomized Music and Preferred Music Groups (370.47s vs. 443.08s and 447.77s; p=0.0095 and 0.0047 respectively). There was no significant difference between average time to task completion between any other groups.

Conclusions

With the knowledge that approximately 63% of operating room staff listen to music on a regular basis, the results of this study demonstrate an important point. Listening to music may be detrimental to individuals who are learning a new surgical skill, regardless of the type of music in use. Therefore, music should be limited in operating rooms where trainees are present in order to provide them with an optimal learning environment.

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Elucidating Global Radiation-induced Tumor Microenvironment Modifications that affect Tumor Response to Therapy

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Introduction

Previously we demonstrated hematopoietic stem and progenitor cell (HSPC) migration to solid tumors after radiation therapy. A recent clinical trial demonstrated pulsed radiation therapy (PRT) improved survival of patients with GBM compared to standard radiation therapy (SRT). Here, we tested PRT efficacy in non-small cell lung carcinoma, examining the effect on tumor volume and tumor expression of colony stimulating factor (CSF)-1, a factor known to induce HSPC differentiation into tumor supportive M2-macrophages.

Methods

Experiment 1: Lewis lung carcinoma (LLC) cells were cultured in vitro and irradiated with a single 2 Gy dose. LLC cultures were collected at predetermined times, RNA was extracted, and subsequently assayed for CSF-1 mRNA expression.

Experiment 2: LLC tumors were subcutaneously injected into the flank of C57Bl/6J mice and separated into three cohorts. Cohort 1 received SRT (2 Gy/day for 5 consecutive days with a 2-day break for two weeks), cohort 2 received PRT (10 x 0.2 Gy/day with a 3-minute interval between each 0.2 Gy for 5 consecutive days with a 2-day break each week for two weeks), cohort 3 received no radiation (NRT). Tumor volumes were calculated daily and resected at day 6 and 12.

Results

Experiment 1: CSF-1 remained at baseline until approximately 16 hours post radiation during which time CSF-1 gradually increased. This demonstrates that radiation alters the activity of tumor cells to produce M2-macrophage favoring factors.

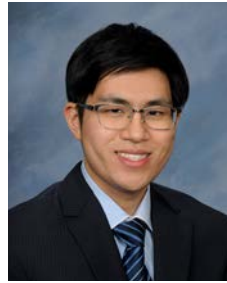
Experiment 2: SRT reduced tumor volumes compared to NRT. PRT reduced tumor volumes compared to both NRT and SRT cohorts. mRNA expression of iNOS, a tumor-suppressive M1-macrophage differentiation factor, was significantly lower in SRT compared to NRT, but was maintained in PRT.

Conclusions

While SRT significantly reduced tumor volume, PRT maintained tumor killing with the added potential benefit of preventing the differentiation of intratumoral HSPCs into M2-macrophages, which aid tumor regrowth post radiation therapy.

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Unfolded Protein Response in Sinonasal Inverted Papilloma

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Introduction

Sinonasal inverted papilloma is a benign but locally aggressive tumor in the nasal cavity. Treatment is challenging due to its high recurrence rate and potential for malignancy. The unfolded protein response has become a popular target in certain head and neck cancers. It could offer an effective therapeutic approach for inverted papilloma. The objective of this study is to determine whether unfolded protein response signaling is increased in inverted papilloma, as compared to normal nasal mucosa, that could be leveraged as an anti-proliferative target.

Methods

Inverted papilloma tissue samples and normal sinus mucosa were collected from fresh surgical specimens and evaluated for the expression of a key unfolded protein response chaperone called BiP/GRP78. Immunohistochemistry was used to quantify the expression of BiP/GRP78 protein based on the product of staining intensity (0-3) and the percentage of stained area (0-20%=1, 21-80%=2, 81-100%=3). This analysis was carried out in a blinded fashion by two independent reviewers using 44 inverted papilloma tissue samples and 22 normal tissue samples that were arranged in a tissue microarray.

Results

There is a significantly increased expression of BiP/GRP78 in inverted papilloma compared to normal tissue samples in terms of intensity and widespread area ($p < 0.001$ for both reviewers). There was no significant difference between both reviewers ($p = 0.09$).

Conclusions

BiP/GRP78 is significantly upregulated in inverted papilloma tissue compared to normal mucosa. This is the first study to show an increased unfolded protein response in inverted papilloma that may help direct future therapeutic options.

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Copy Number Variants of Uncertain Significance in Neurodevelopmental Disorders from Clinical Chromosomal Microarray

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Introduction

Chromosomal microarray analysis (CMA) is a first line genetic test in patients with neurodevelopmental disorders (NDD) and congenital anomalies. When testing for genetic changes, laboratories typically categorize their findings as pathogenic variant, variant of uncertain significance (VUS), or benign variant. VUS is defined as an identified variant that has an unclear relationship to a patient's clinical phenotype, such as NDD. The rationale for this research is to analyze the frequency of specific VUS in NDD patients in order to identify the smallest region of overlap (SRO) to pinpoint putative NDD genes.

Methods

The database of results from CMA testing of patients with NDD at Beaumont Royal Oak was reviewed to identify patients in whom VUS had been identified. Recurrent VUS were mapped onto UCSC Genome Browser to determine SRO and compared to the Database of Genomic Variants (DGV), which represents chromosomal variants found in normal controls. Putative NDD genes from SRO will be reported along with clinical findings to identify genotype-phenotype correlation.

Results

VUS had been identified in 134 patients. Specific chromosomal loci were enriched in CNVs compared to control studies: 15q13.3 (n=7), Xp22.33 (n=7), 16p13.11 (n=5), 16p13.2-16p13.3 (n=5), and 1q21.1 (n=4). Examples of putative NDD genes from SRO include CHRNA7, NDE1, and RBFOX1. In general, the frequency of the variants is difficult to compare with that of the general population because in the latter group, variants in these regions tend to be smaller.

Conclusions

While developmental delay, autism spectrum disorder, congenital anomalies, and abnormal physiologic development were common characteristics, no clear genotype-phenotype correlation was distinguishable due to wide clinical heterogeneity. However, candidate NDD genes identified from this study are involved in mechanisms of neuronal signaling, cellular migration, and development. These genes can better inform the pathophysiology of NDD.

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Activation of p38-MAPK is Required for VEGFA165-induced Migration, but not Proliferation, of Primary Human Retinal Microvascular Endothelial Cells

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Introduction

In addition to the well-known pathological consequences of elevated total VEGFA, reports of isoform switching of VEGFA165b to VEGFA165a in the vitreous of patients with proliferative eye diseases led us to ask whether this isoform shift is a significant contributor to the hyperactivation of primary human retinal microvascular endothelial cells (HRMECs). As part of this investigation, we compared the contributions of MAPK, AKT, and p38-MAPK to proliferation and migration in primary HRMECs using in situ immunofluorescence assays.

Methods

VEGFA165 isoforms were compared for their effects on cell proliferation, measured with infrared-fluorescence Cell-Tag assays. Cell migration was compared using a fluorescent transmembrane migration assay in the multiwell plate format. Relative contribution of the MAPK, AKT, and p38-MAPK pathway to cell proliferation and migration were assessed using pharmacological inhibition of MAPK, AKT, and p38-MAPK activation.

Results

Supplementation with 500 pM and 5,000 pM of VEGFA165a or VEGFA165b caused an increase in the basal proliferation rate of primary HRMECs, but did not detect any significant difference between both isoforms. VEGFA165a stimulated cell migration more than 6-fold compared to VEGFA165b at 1000 pM. The p38-MAPK inhibitor SB203580 increased HRMEC proliferation but was also found to be a potent activator of MAPK, while blocking p38-MAPK activation. Inhibition of MAPK with U0126 (MEK inhibitor), did not inhibit VEGFA165-induced migration. Inhibition of AKT activation with MK2206 did not inhibit a VEGFA165-induced cell migration. Inhibition of p38-MAPK with BIRB796 completely blocked VEGFA165-induced cell migration.

Conclusions

VEGFA165b was a poor activator of HRMEC migration at lower, physiological, concentrations where VEGFA165a induced substantial cell-migration. This was consistent with our dose-response analysis of their relative activation of intracellular signaling pathways (MAPK, AKT, and p38-MAPK). VEGFA165 driven cell-migration was mostly mediated via activation of the p38-MAPK pathway. VEGFA165-induced proliferation of primary HRMECs did not require activation of p38-MAPK in addition to MAPK.

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5-HTTLPR Modulation of Amygdalar Functional Connectivity and Emotional Regulation: A Systematic Review

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Introduction

Regulatory variation in the serotonin transporter protein gene by 5-HTTLPR may affect functional connectivity between various brain regions and the amygdala, a structure associated with fear response. The short (S) allele of 5-HTTLPR has been associated with dysfunctional emotional processing and is thus a potential risk factor for mood disorder development. Functional connectivity variation may be one mechanism by which the S allele generates pathology. The objectives of this systematic review are twofold: 1.) To review and analyze the literature comparing the effects of 5-HTTLPR polymorphisms on amygdalar functional connectivity and emotional regulation, and 2.) to elucidate an interaction between circuitry and emotional regulation.

Methods

This systematic review employed predetermined inclusion/exclusion criteria to select relevant studies from various databases. Two independent reviewers conducted title and abstract screening on 7504 articles obtained from the preliminary search results. Full-text screening was conducted on all remaining articles. Themes were identified through commonalities between the final 14 manuscripts, and the data was tabulated for reporting and analysis using a customized data extraction table. The final studies were subjected to quality assessment using the Joanna Briggs Institute Critical Appraisal Checklist.

Results

Our results regarding the correlation of the S allele with emotional dysregulation were inconclusive. Consequently, we were unable to elucidate a clear FC x ER interaction. There was a consistent association between 5-HTTLPR genotype and FC variation. Major connections involved the anterior cingulate cortex, prefrontal cortex structures, visual system, and insula.

Conclusions

Mood disorders have arbitrary diagnostic methodology and few treatment options with limited efficacy. Variations in patient genotypes and functional connectivity may provide a measurable phenotype upon which diagnosis and treatment can be based. Further research is needed to establish a reliable indicator of emotional dysregulation and to explicate the underlying neural mechanisms.

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The Role of Human Macrophage Histone Deacetylase Proteins in Inflammation and Disease: A Systematic Review

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Introduction

Histone deacetylases (HDACs) have been known to regulate inflammatory gene expression, but their specific molecular and signaling mechanisms of action in the pro-inflammatory gene regulation of human monocytes and tissue macrophages need better understanding. The purpose of the systematic review is to elucidate the exact molecular and signaling mechanisms of HDACs in inflammation to aid in future therapeutic approaches that target the action of human monocytes and tissue macrophage HDACs.

Methods

Literature searches were conducted through PubMed, Embase, Web of Science, CINAHL databases, among others. 1570 articles were identified and screened by title, abstract, and then full text by two independent reviewers. Studies involving animal models and in vitro animal and human monocyte/macrophage cell cultures were excluded. Data extraction was performed and cross-checked by a separate reviewer. Quality assessment was performed using the Joanna Briggs Institute's (JBI) critical appraisal tool for systematic and experimental research. Results were grouped into three human inflammatory disorders: chronic respiratory disease, joint inflammation, and atherosclerosis.

Results

HDAC2 was downregulated in the large and small airways of both smokers with and without COPD. However, smokers with COPD had significant HDAC2 downregulation in the small compared to large airways. Furthermore, reduced protein expression of HDACs 1 and 2 contributes to the pathogenesis of rheumatoid arthritis, probably by activation of proinflammatory transcription factors. In atherosclerotic disease, HDAC9 expression correlated significantly with MMP12 expression in carotid artery plaques.

Conclusions

This is the first systematic review to synthesize all available data on the action of HDACs in specific human inflammatory disorders. This review provides evidence for epigenetic regulation of HDACs in human monocyte and tissue-resident macrophage development, innate immunity, inflammation, and tissue repair. Elucidating the molecular and cellular mechanisms of action of the HDAC classes allows for the development of future therapeutic approaches that selectively target human monocytes and tissue macrophages.

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The Effects of Bazedoxifene Acetate on Breast Cancer Cells

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Introduction

In recent years, steroid analogs have been developed with potentially fewer or no side effects in breast cancer patients using endocrine therapy. A third-generation drug, Bazedoxifene acetate (BZA) has properties similar to current treatments in breast cancer. Therefore, determining the effects of BZA on steroid receptors and tumor suppressor genes in breast cancer is essential. The aims of this study were to examine the effects of BZA on ER α and BRCA1 in MCF-7 breast cancer cells.

Methods

Cells were cultured in a medium containing 5% charcoal-stripped fetal bovine serum for 6 days in order to deplete any endogenous steroids or effectors. Then treated for 24-hours with various BZA concentrations, hormones, and antihormones. Transcriptional expression was analyzed via RT-qPCR. Image cytometric analysis with propidium iodide staining was utilized to detect cellular viability changes. Apoptosis assay was performed to determine whether BZA causes cells to undergo apoptosis.

Results

The results were expressed as a mean \pm SEM. Statistical significance was determined by Kruskal-Wallis test followed by post-hoc analysis using Mann-Whitney U-Test. Differences were considered significant at $p < 0.05$. Western blot analysis revealed a decrease in the ER α and BRCA1 protein levels, 48% and 62% respectively. Transcriptional expression of mRNA levels correlated with the western blot. After a 6-day treatment with 1nM to 2 μ M BZA, cellular proliferation decreases. The treatment with BZA alone caused a 10-fold cell proliferation compared to the estrogen-treated cells, which suggests its anti-proliferative effects. Cells underwent apoptosis with treatment of BZA.

Conclusions

These findings provide a better understanding of the effects of BZA on breast cancer cells. BZA exhibits the antiestrogenic effects on breast cancer tissue as a SERM would. More research is required to explain its exact mechanism of action to further BZA becoming FDA approved in breast cancer treatment.

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Effectiveness of Health Information Literacy Training for Patients Experiencing Homelessness

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Introduction

Low health literacy has significant implications for healthcare including increased hospitalizations and health care disparities. This is exacerbated in patients experiencing homelessness who are at greater risk for many health conditions. Although studies have been conducted that aim to assess and teach health literacy, only few assess health literacy programs for homeless patients. This study seeks to engage medical students in community-based research projects and use health information training to improve health literacy of homeless patients.

Methods

A medical student in collaboration with faculty developed health literacy training workshops. They established a health information station with a computer, printer, and educational materials, as well as a website with health resources. Training efficacy was assessed using a pre- and post-questionnaire. Modules covering key aspects of the training were provided to participants for review.

Results

23 homeless clients from Pontiac, Michigan were surveyed. 75% of clients' health literacy scores increased between the pre- and post-questionnaires. There was an increase of 4.5% to 31.8% of clients indicating that the HOPE Resources Website was a main source of health information (p-value = 0.02). Clients indicating MedlinePlus as a main source of health information increased from 4.5% to 54.5% (p-value = 0.0003).

Conclusions

Health literacy training can significantly increase clients' awareness of positive health information seeking behavior and reliable health resources. The results suggest implications for creating opportunities for medical students to engage in community-based projects and providing health information literacy education as a feasible intervention to increase health literacy of homeless patients, to help reduce health care disparities.

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Sustained Health Intervention Outcomes Over Two Years in a Rural Community

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Introduction

The rise in childhood obesity has become a public health issue. Rural children experience a greater risk of obesity than urban children. Project Healthy Schools (PHS) is a school-based wellness intervention designed to educate middle school students about healthy lifestyles, with the goal of decreasing childhood obesity and the associated long-term cardiovascular risks. This study aims to evaluate the sustainability of a school-based wellness intervention program targeting childhood obesity in rural communities.

Methods

Physiologic and health behavior data were collected from middle school students participating in PHS from schools in Shiawassee County, a mid-Michigan rural community. Baseline data were collected in 6th grade, prior to the PHS intervention. Follow-up data were collected both immediately following the intervention (approximately 6 months post-baseline data collection) and 2 years post-intervention (in 8th grade). Physiologic measurements (e.g. height, weight, blood pressure, heart rate, lipid panel) and health behaviors (e.g. dietary, physical activity, sedentary habits) were compared for baseline, immediately post-intervention, and 2-year follow-up data.

Results

An improvement in total cholesterol was seen post-intervention (p-value 0.006). A significant increase in vigorous exercise (p-value <0.001) and a significant decrease in television screen time (p-value <0.002) were seen at 2 years follow-up. Compared to baseline, reductions in unhealthy food intake (non-fruit juice and fried snacks), an increase in moderate exercise, and a reduction in video game screen time were seen (p-value <0.05).

Conclusions

The results support the hypothesis that instituting a school-based interventional program in rural communities is beneficial in addressing cardiovascular risk. Incorporation of the PHS curriculum has led to significant improvements in the physiological measures and health behaviors of this rural population. This study provides greater insight on the effectiveness of a health-promoting school program in a rural community, which may prove beneficial for the growth and improvement of Project Healthy Schools.

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Impact of Attention-Deficit/Hyperactivity Disorder on the Timing of Autism Spectrum Disorder Diagnosis

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Introduction

Timely diagnosis of Autism Spectrum Disorder (ASD) allows access to early intervention and better outcomes. Thus, identifying factors that contribute to age of diagnosis is essential. Attention-Deficit/Hyperactivity Disorder (ADHD) is commonly found with ASD but dual diagnosis was not possible until 2013. This study investigated the impact of comorbid ADHD and other common conditions on the timing of autism diagnosis.

Methods

National Survey of Children's Health data from 2017-2018 were used for this study. Children with a current ASD diagnosis with known ADHD diagnostic status were included. Univariate and multivariate models predicted the impact of co-occurring conditions and sociodemographic factors on the timing of ASD diagnosis.

Results

Participants (N = 1,261) were aged 2-17 and diagnosed with ASD. Comorbid ADHD delayed ASD diagnosis by 1.26 years ($p = 0.0105$), or by 5 months (0.44 years) after adjusting for other variables ($p = 0.2284$). Parents/guardians with a high school education or less were diagnosed 1.12 years later ($p = 0.0294$). Comorbid anxiety delayed ASD diagnosis by 1.06 years ($p = 0.0007$). Children with mild ASD were diagnosed later than those with moderate (1.29 years earlier; $p = 0.0072$) or severe ASD (1.66 years earlier; $p = 0.0001$). Earlier diagnosis was observed with comorbid developmental delay (1.23 years earlier; $p = 0.0252$) and speech problems (1.8 years earlier; $p \leq 0.0001$).

Conclusions

Comorbid ADHD diagnosis leads to a later ASD diagnosis, though this relationship is obscured by other diagnostic factors such as anxiety, developmental delay, speech problems, ASD severity, and parental education. Given that early diagnosis and intervention are critical for improving long-term outcomes, screening must include co-occurring conditions, especially in young children.

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Addressing Healthcare Disparities of Individuals with Developmental Disabilities: A Systematic Review

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Introduction

Individuals with intellectual and developmental disabilities (ID/DD) experience disparities in their healthcare. These disparities can be described as differences in access, use, or quality of healthcare received by this population group compared to others. Preliminary searches suggest a gap in interventional research to address healthcare disparities faced by ID/DD individuals. Through qualitative synthesis, this review aims to assess existing knowledge on the topic of healthcare interventions for individuals with developmental and intellectual disabilities in order to guide future interventional approaches.

Methods

Comprehensive searches were completed across 9 databases such as PubMed, PsycINFO, and CINAHL. Key search terms and subject headings included developmental disability, “inservice, training/methods,” healthcare disparities, and “health care quality, access, and evaluation.” Abstract and full text screenings were conducted by two independent reviewers against inclusion and exclusion criteria. Data extraction and critical appraisal utilizing the Joanna Briggs protocol was conducted on the included studies. Qualitative analyses were completed using thematic synthesis methods from Braun and Clarke’s Principles for Thematic Analysis.

Results

The searches gathered 6170 references and 18 full-text articles were selected for inclusion, with 16 novel interventions represented. Interventions were classified into 3 main groups: healthcare education, healthcare delivery, and healthcare communication tools. Identified themes included: the challenge of obtaining direct health outcomes data for the ID/DD population, feasibility of involving the ID/DD population in healthcare disparities research, and the presence of uncertainty and knowledge limitations among both patients with ID/DD and their providers when navigating healthcare interactions.

Conclusions

Existing knowledge of healthcare interventions for the ID/DD population is limited to short-term outcomes and indirect measures of healthcare disparities. Further inclusion of ID/DD population in healthcare disparities research is feasible and necessary. Additionally, long-term studies of interventions with a multifactorial approach are warranted to improve the healthcare received by those with intellectual and developmental disabilities.

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The Use of Metaphor in Breast Cancer Online Discussion Forums

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Introduction

Illness constitutes an experience broader than the pathophysiology of the disease itself, and language gives form to that experience. Cognitive Metaphor Theory establishes metaphorical language as a means by which humans perceive and take action in the world. This study examines how breast cancer metaphors are used in an online breast cancer forum, and provides insight into the breast cancer experience.

Methods

Data was collected from a thread called “Just Diagnosed” on <https://community.breastcancer.org/> by querying any discussion topic within the thread that had a posting within the last 6 months of the collection date (October 28, 2019). These discussion topics were collected and analyzed with NVivo qualitative data analysis software (QRS International Pty Ltd). A grounded theory approach identified metaphors that were further analyzed through close reading.

Results

The data included 2,460 posts within 130 threads. Three metaphors emerged from the analysis: CANCER IS A ROLLER COASTER, CANCER IS A LONG HAUL, and CANCER IS A MARATHON. They are related to the well studied journey metaphor, but have important nuances. The roller coaster metaphor communicates disorientation, and may serve as a way to help cancer patients reorientate their lives within the experience of a cancer diagnosis. The long haul metaphor was used to characterize cancer as an ongoing burden, and could be a freeing or comforting statement. The marathon metaphor was used to emphasize the need for endurance, and the idea of a unmanageable task.

Conclusions

The results of this study are ultimately consistent with other research that has demonstrated that the usefulness or function of a metaphor varies depending on the user. A health care provider should seek to better understand what patients are trying to communicate about their experiences by understanding the implications of the metaphors they use, and should tailor their own use of metaphor to the patient.

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Exploring the Implications of Race and Pre-Gestational Diabetes Mellitus on Maternal/Fetal Outcomes

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Introduction

Adverse pregnancy outcomes including the risk of gestational diabetes associated with racial disparities have been well-documented in the literature. However, the implication of pre-gestational diabetes on perinatal complications among racial groups has not been well-studied. This study aims to understand whether adverse perinatal outcomes are increased in non-white racial groups when compared to the white group.

Methods

Retrospective, case-control chart review of patients with pre-gestational diabetes who received prenatal care from maternal-fetal medicine specialists and delivered in a Michigan hospital system January 2013 through December 2017. Maternal, fetal, and neonatal outcomes were collected from records. White patients were compared to non-white (Black, Hispanic, Asian, and Native American) patients. Multivariate regression analysis was conducted to calculate odds ratios.

Results

A total of 259 patient records were included. Compared to white patients, non-white patients had higher rates of Type 2 diabetes (79.8% versus 49.4%, $P < 0.0001$) and higher hemoglobin A1C levels before delivery (6.58% versus 6.26%, $P = 0.0426$). There were no differences in perinatal outcomes, except decreased birth weight in non-white patients compared to white patients (3.22 kg versus 3.47 kg, $P = 0.0098$).

Conclusions

Despite the trend of accepting race as a risk factor for adverse perinatal outcomes, the results support no clinically significant increased risk for the assessed perinatal outcomes in the non-white racial group. Uniformity in access to appropriate prenatal care potentially accounts for the relative parity among the racial groups. In the context of alleviating disparities, this indicates the critical role of access to optimal care for high-risk diabetic pregnancies.

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Role of STEM and Gender in Student Experience of Sexual Harassment by Faculty and Other Students

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Introduction

Sexual harassment is a prevalent issue experienced by students on US college campuses. However, limited data analyzes the potential influence of the STEM (Science, Technology, Engineering, and Mathematics) environment on self-reported levels of sexual harassment within female and male students in STEM and non-STEM majors.

Methods

Undergraduate and graduate students (n = 424) enrolled in a Midwestern university completed an online survey to assess self-reported levels of victimization, perceived benefits of campus resources, and health consequences. Students' responses were separated and analyzed in four groups based on gender and STEM vs non-STEM fields of study. Monetary compensation was provided for successful survey completion.

Results

Multiple regression analysis demonstrated an interaction between gender and STEM student status was a significant predictor of sexual harassment victimization by other students. ($\beta = .11$, $t = 2.11$, $p < .05$) with an R^2 of .01. Female students in STEM reported the highest rates of sexual harassment by students when compared to non-STEM female students and both STEM and non-STEM male students. ANOVA analysis examining health differences in the two female subgroups [$F(1, 252) = 4.29$, $p < .05$] found women in STEM reported more symptoms of depression ($M = 14.76$, $SD = 4.58$) than women in non-STEM programs ($M = 13.53$, $SD = 4.33$). Despite reporting higher incidence of harassment by faculty and students, no significant differences were seen between STEM and non-STEM females.

Conclusions

Women in STEM reported both the highest levels of sexual harassment and symptoms of depression compared with their non-STEM peers, which aligns with previous research on how social climate can impact health and long-term success in STEM. By identifying the populations experiencing high rates of sexual harassment victimization we can help to begin to understand how their academic environment contributes to this experience.

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Understanding “Obamacare”- How Physicians and Medical Students View the Affordable Care Act: A Systematic Review

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Stephanie Swanberg, M.S.³

Introduction

Since its passage in 2010, the Affordable Care Act (ACA) has been a source of political debate. With increased numbers of insured patients nationally, drastic changes to the healthcare system and workload of physicians are inevitable. As behavioral theory suggests that personal opinion impacts action, the personal opinions of the ACA will impact physicians' practice and decisions about which patient populations they care for. This project aims to systematically investigate the perceptions, opinions, and knowledge of physicians and future physicians from varying specialties toward the ACA.

Methods

Comprehensive searches were conducted in 10 databases. Search terms included physicians, medical students, Affordable Care Act, perceptions, thoughts, opinions, and knowledge. Abstract and full text screenings were conducted by two independent reviewers against inclusion and exclusion criteria. Surveys, editorials, and case reports were also included. Following the screening process, data extraction and critical appraisal were conducted using the Joanna Briggs critical appraisal checklists. Qualitative review and thematic analysis were completed.

Results

The searches gathered 5231 results with 1003 duplicates removed, 4228 references for title/abstract screening, and 92 articles assessed for full text review, with 20 ultimately included. Thematic analysis showed that support for the ACA amongst physicians falls along political party lines, regardless of specialty type. Additionally, support for the ACA amongst primary care physicians was found to be stronger than amongst surgical or procedural specialists, including for medical students based upon anticipated specialty.

Conclusions

There are clear differences in the support of the ACA by a physician's specialty and political party, including among students based on future specialty. Understanding the overall climate toward health insurance expansion among all physicians and future physicians in the US could help us understand where gaps exist in medical education around health policy and help to increase involvement of physicians and students in future policymaking.

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Inverse Relationship Between Job-related Trauma and PTSD Symptoms in Emergency Workers

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Introduction

Post-traumatic stress disorder (PTSD) is a disorder that is often thought of in the context of soldiers returning from war. Emergency services workers who witness traumatic experiences, such as death or serious injury, are also susceptible to developing PTSD, however. Until now, this is a population in which the effects of job-related trauma have not been well studied. As such, the current study is designed to examine how trauma exposure relates to PTSD in these individuals.

Methods

A total of 282 individuals that work as an emergency medical technician (EMT) or as an emergency department nurse (RN) were recruited to participate in the study. Recruitment for the study was accomplished through internet postings. A survey was distributed to those who chose to participate in the study. This survey incorporated several verified questionnaires to assess trauma exposure and PTSD symptoms. Correlational and regression data analyses were utilized.

Results

Those individuals with a career as an EMT reported a statistically significant increase in PTSD symptoms as compared to their RN counterparts. When comparing self-reported job-related trauma to number of PTSD symptoms, a correlation of -0.436 was found to be significant. When comparing length of exposure (job duration) to number of PTSD symptoms, a correlation of -0.024 was found to be non-significant.

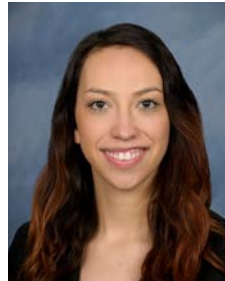
Conclusions

Contrary to what was hypothesized, a greater number of reported traumas was related to lower PTSD symptom severity. It could be that those who have endured more traumas have developed better coping mechanisms, but further research would be required to investigate this. Altogether, despite limited research into the effects of PTSD on emergency workers, the research to date in this area has proven that individuals in these professions may be more susceptible to PTSD. Future research projects are warranted to better study how the effects of PTSD can be mitigated in this population.

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Examining Predictors for Increased Alcohol Use in Emergency Medical Workers

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Introduction

Previous studies show that increased alcohol use is associated with post-traumatic stress disorder (PTSD), sleep disruption, and trauma type. There is no extensive research on these predictors and increased alcohol use in emergency medical workers. These workers may be more susceptible to PTSD given they are first responders to traumatic events. More knowledge about these variables can shed light on a possible issue affecting workers, and we can work to develop screening protocols and trainings.

Methods

We distributed a survey to 282 emergency medical workers i.e. nurses and emergency medical technicians. The survey asked questions regarding their sleep schedule, alcohol intake, and exposure to trauma. In order to analyze the individual effects of PTSD symptoms, trauma type (accidental and interpersonal) and sleep disturbance on alcohol use. A regression model was conducted.

Results

The overall model was statistically significant ($p < .001$). Further breaking down each predictor showed no significance for both interpersonal trauma ($p = .331$) and accidental trauma ($p = .417$). Sleep disruption ($p < .05$) and PTSD symptoms ($p < .001$) were significantly related to alcohol consumption. When comparing severities, only severity of PTSD symptoms remained a significant predictor ($p < .01$). The number of accidental traumatic events appeared to be the strongest predictor of PTSD symptoms at the bivariate level ($p < .01$). The results suggested individuals with PTSD reported increased alcohol use when compared to those without PTSD; ($p < .001$).

Conclusions

Within this sample of emergency medical workers, 327 traumatic events were reported (one person could have multiple experiences), and 219 people with probable PTSD. We showed that PTSD is associated with increased alcohol consumption, and accidental trauma is the strongest predictor for PTSD symptoms. Further studies need to be conducted to ensure that workers on the front lines are getting the necessary treatment and attention they deserve.

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Tonic Immobility and Post Traumatic Stress Symptom Severity in Relation to Potentially Traumatic Police Interactions

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Introduction

Police brutality is regularly in the spotlight due to highly publicized police shootings of unarmed Black civilians. Tonic immobility is an evolved defense response characterized by physical immobility and can be experienced during perceived traumatic events. Examining the traumatic nature of police interactions could help reduce police brutality by explaining behavior of citizens during interactions and reduce trauma-related outcomes like post-traumatic stress symptoms (PTSS). It was hypothesized that greater tonic immobility would be associated with increased PTSS severity and there would be racial differences in reports of tonic immobility and PTSS severity.

Methods

Participants (N = 761, 29.4% Black/African-American) were recruited through Amazon Mechanical Turk (MTurk), and the Psychology Department subject pool at a large, Midwestern university. An anonymous cross-sectional survey was completed by participants. The Tonic Immobility Scale (Forsyth et al., 2000) was used to assess tonic immobility and the Post-Traumatic Stress Disorder Checklist (Weathers, et al., 2013) was used to assess PTSS severity. The instructions were revised to ask participants to respond to each item regarding their most distressing interaction with Police.

Results

The results suggest that greater tonic immobility is related to greater PTSS severity ($r = 0.761$, $p < .001$). Further, in relation to police interactions, Black/African-American participants reported great tonic immobility $t(330.474) = -4.565$, $p < .001$, and greater PTSS severity, $t(336.139) = -3.541$, $p < .001$, compared to White/Caucasian participants.

Conclusions

The results support the hypothesis that tonic immobility and PTSS may result from traumatic police interactions. The results may be important for police officers to understand that citizens may have a traumatic response when interacting with the police. More specifically, people may experience a physiological “freeze” response, which should not be interpreted by police as noncompliance. This understanding could allow police officers approach civilians differently, and possibly decrease the rates of excessive force and mortality.

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Difference in Relationship Between Crisis Support and PTSD Symptoms Across Genders

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Introduction

Previous studies show that social support has influenced PTSD symptoms in individuals experiencing traumatic events. There has not been extensive research on the association between past and present perceptions of crisis support and comparison of PTSD symptoms and their differences across genders. Furthermore, this study will examine this phenomenon in emergency care workers, who are more susceptible to PTSD due to their recurrent direct and indirect exposure to traumatic events. More knowledge about these variables within this population can lead to improved crisis support training, as well as developing protocols and screening.

Methods

The study was distributed online to 282 emergency care workers, i.e., nurses and emergency medical technicians. The survey asked questions about exposure to trauma, gender, and their perceived present and past support after these exposures. The crisis support scale was used to quantify perception of support. A regression model was used to analyze the data.

Results

The overall model showed statistically significant interactions between crisis support and gender. The results suggest that males self-reported having more support than females when examining past perceptions of support ($p < 0.05$), but no differences when it came to present perceptions of support. Furthermore, the relationships between PTSD symptoms and perceived crisis support were significant, for both past and present perception.

Conclusions

Within this sample of emergency care workers, we show that there is a discrepancy between perceived support between different genders, as well as the influence of the support on probability of developing PTSD symptoms. Further studies can be conducted to further examine the specific reasons for this discrepancy to help ensure that there is not only more balanced support between genders, but also to improve prevention of PTSD and necessary intervention when symptoms do present.

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Emergency Department Utilization by Families with CPS Encounters

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Introduction

Previous analysis of the population of children involved in child protective services (CPS) suggests that this group faces an increased risk of mental and physical illness, and specifically that they present to the emergency department (ED) more frequently than their peers. New data was collected in the National Survey of Child and Adolescent Wellness (NSCAW) II that has not been analyzed with this relationship in mind. This project investigates ED use in this group and how it varies with child/caregiver characteristics.

Methods

NSCAW II survey data were collected from 5,873 children and their parents, caregivers, and caseworkers at various timepoints after their CPS case closed between February 2008 and May 2009. Univariate and multivariate logistic regression analyses compared rates of ED use to several child and caregiver characteristics. These results were compared to similar analyses of NSCAW I data from 1999-2003.

Results

Adjusted odds ratios demonstrate significant correlations between any ED use and child age 6-17 years (0.51 vs. 0-5 years), chronic health problems (2.58), female caregiver (1.86), caregivers with high school (1.43 vs. none) or postsecondary education (1.43 vs. none), separated/widowed/divorced caregivers (1.36 vs. married), and caregivers experiencing minor intimate partner violence (0.48). For repeat ED use, correlations also emerged with income greater than \$40,000 (0.54 vs. less than \$10,000) and caregiver depression (1.56).

Conclusions

These results demonstrate little change between the NSCAW II cohort and the earlier NSCAW I cohort. Rates of ED use and independent predictors of ED use have remained consistent between the two datasets. This validates the trends noted in earlier analysis and points to future research that should investigate the causative mechanisms behind these trends.

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A Qualitative Evaluation of the Healthy Pontiac Prescription for Health Program

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Introduction

The Healthy Pontiac Prescription for Health program aimed to connect patients with chronic diseases known to be influenced by diet and physical activity with local resources to support improvements in nutrition and exercise. The program was evaluated qualitatively through participant interviews after the completion of the program. There currently exists no literature on demographics studied in this program as well as statistical and qualitative analyses on the Prescription for Health Programs.

Methods

Participants were recruited based on limited access to fresh foods, low income, and a chronic disease. At the end of the program, 30 participant interviews were conducted. Participants were divided into 3 groups: those that fully completed the program, enrolled and partially completed, and did not enroll. Participants were asked questions about their experiences, motivating factors, perceived health benefits, barriers to complete program, and social support systems.

Results

Motivating factors among all three groups included access to fresh food (n=30). Full completion noted financial considerations (n=10), weight loss (n=1), and pharmacologic alternatives (n=1). All groups identified improvement in chronic conditions (n=6) as a perceived health benefit. Full participation identified increased health awareness (n=5) and fresh food access (n=4). Partial and none identified weight loss (n=3). Barriers to completion in the partial and none groups were work conflicts (n=5), transportation (n=4), and medical reasons (n=2).

Conclusions

Themes within the three groups of participants were identified that will improve the efficacy of further community approaches to health awareness. There was a direct relationship between those that fully completed and social support systems. Those that did not enroll identified a small or unreliable support system. Moving forward, improvements in programs similar to this include setting goals and more flexibility with scheduling. Overall, the Healthy Pontiac Prescription for Health program helped increase awareness of healthy lifestyles to lead to healthier medical outcomes.

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Understanding Opioid Addiction in the Chaldean Community

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Introduction

The Chaldean community is a minority population of Iraqi-Christians concentrated in Iraq and throughout several communities in the United States. Similar to the rest of the United States, this community is affected by substance abuse issues, however there is an additional stigma associated with it. There is currently a gap in the literature regarding substance abuse in the Chaldean community, specifically with opiates. This study was developed to assess the knowledge, attitudes, and beliefs among Chaldean community members in regards to the opioid epidemic, as well as to identify resources needed to combat opioid addiction in the community.

Methods

An electronic survey was created through Qualtrics® and sent to Chaldean community organizations. The online questionnaire was approximately 10 minutes in length and contained a total of 41 questions in the English language, including Likert scale, open-ended, and check all that apply. All organizations were asked to forward the survey at their discretion. With their permission, the survey was also posted on their Facebook pages. Results were presented as frequencies and percentages.

Results

Of the total sample (n=199), 78% (154) of respondents were female with an average age of 31 years old. Of the 199 respondents, 90% (178) identified an opioid problem in the Chaldean community, in which 48% (94) knew someone with an addiction. Of the respondents, 97% (174) felt educational resources about addiction should be translated into other languages.

Conclusions

The results of the survey indicate that members of the Chaldean community feel that there is an opioid problem within the community, in which many feel that additional resources are needed to help those struggling with addiction. These results may guide the improvement and development of resources, including translated materials, to help combat opioid addiction in the Chaldean community.

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Challenges Perceived by Discharge Planners Working with Homeless Patients: A Narrative Analysis Approach

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Introduction

Discharge from a hospital setting poses challenges for patients and often results in adverse events and readmissions. Patients experiencing homelessness are particularly vulnerable to these risks and routinely experience lower quality discharges. Improper discharge of these patients not only negatively impacts their health, but creates a financial burden for hospitals. The primary goal of this study is to understand barriers for safe and effective discharges for homeless patients and to identify institutional or community-based supports.

Methods

We utilized an anonymous Qualtrics survey to collect narrative data regarding hospital-based case managers' perceptions of the challenges surrounding safe discharge for homeless patients, as well as their ideas about additional resources that would improve this process. The survey contained five, open-ended questions and was distributed via email to a listserv for the American Case Management Association to case managers from across the United States (n=825). Responses were analyzed using narrative coding techniques to identify emergent themes.

Results

Case managers reported barriers to safe discharge that primarily were grounded in a lack of sufficient resources. This included a deficit of material resources, such as shelter, transportation, medication, and insurance; limited staff education and awareness of the issues surrounding homelessness; and insufficient institutional support. Case managers perceived these resource challenges to be further complicated by conceptual disagreements among staff and patients regarding the fluid and contested meanings of the notion of safety itself within this patient population.

Conclusions

In order to better equip discharge planners to address the barriers that come with working with individuals experiencing homelessness, both the insufficient resources and conceptual differences in the notion of safety should be addressed. Ultimately, this will serve not only to promote work satisfaction in case managers, but reduce financial burdens to hospitals, and improve the care and health outcomes of homeless patients.

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Post-traumatic Cognition Influence on Formation of Work Based Trauma PTSD

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Introduction

Post-traumatic stress disorder, PTSD, can occur in emergency care workers following workplace trauma. While current theory suggests that PTSD severity is mediated by post-traumatic cognitions (PTC) in accident victims, this study aimed to determine if similar influence existed in emergency personnel.

Methods

Data was collected through a Qualtrics survey administered to EMTs and nurses. A series of ANOVAs (analyses of variance) and post-hoc comparisons were run to identify the influence of PTC on PTSD development between groups. A t-test compared levels of PTC in those with and without PTSD symptoms. A moderation model compared the number of traumas to PTC levels in each population.

Results

The ANOVAs suggested differences between jobs on both PTC [$F(2,279) = 38.447, p < .001$], and PTSD symptoms [$F(2, 279) = 17.441, p < .001$]. Post-hoc comparisons suggested EMTs ($M = 106.29, SD = 34.54$) reported less PTC than RNs ($M = 144.80, SD = 53.11$) or participants in both professions ($M = 144.30, SD = 32.81$); but more PTSD symptoms ($M = 48.20, SD = 14.98$) than both RNs ($M = 33.67, SD = 18.00$) and those in both professions ($M = 37.85, SD = 15.27$). The t-test suggested that those with PTSD reported more PTC ($M = 123.05, SD = 39.98$) than those without PTSD ($M = 110.89, SD = 37.03$); $t(107.11) = -2.26, p < .05$. The moderation model indicated repeat trauma increased PTC [$F(2, 276) = 3.82, p < .05$].

Conclusions

This study showed that those with PTSD symptoms reported higher PTC, and that repeat trauma increased PTC. Conflictingly, EMTs reported lower levels of PTC than RNs, yet a higher level of PTSD symptoms. This data indicates that PTC play a significant role in the development of PTSD symptoms in emergency personnel, but that other influencing factors must exist.

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A Quantitative Evaluation of the Healthy Pontiac Prescription for Health Program

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Introduction

The Healthy Pontiac Prescription for Health program is aimed at connecting patients with documented chronic diseases with local resources to support improvements in nutrition and exercise. Program participants were provided with educational sessions and vouchers to redeem at fresh markets and exercise facilities. The effectiveness of the program will be assessed through changes in fruit and vegetable consumption through voucher usage and changes in Body Mass Index (BMI). This project aims to address the lack of analysis of similar previously established programs in the literature.

Methods

Physicians at the three partner healthcare facilities referred overweight or obese patients with documented hypertension to the program. Of the referred patients, 103 participants were enrolled in the 3-month program. During the enrollment session, participants were questioned about eating habits. Blood pressure and BMI measures were also obtained. Participants then attended educational sessions, and received vouchers worth \$120 redeemable for fresh produce at a fresh market or for physical activity at a gym. The data collected includes voucher redemption, a pre- and post-program survey along with BMI and blood pressure measurements. A paired sample t-test was used to analyze the collected pre- and post-program data.

Results

There was no statistically significant difference in BMI (pre-program= 36.81 ± 7.00 ; post-program 36.62 ± 7.17 ; $t=0.538$, $p=0.593$) and in daily vegetable consumption (pre-program = 2.56 ± 2.04 servings; post-program= 3.03 ± 1.53 servings; $t=-1.598$, $p=0.118$). However, there was a statistically significant increase in daily fruit consumption from 1.79 ± 1.49 servings to 2.69 ± 1.42 ($t=-2.883$, $p=0.006$) and decrease in daily sugar beverage consumption from 2 servings to 1.44 ($t=2.269$, $p=0.029$).

Conclusions

Implementing community programs that increase access to healthy foods and physical activities in underserved areas can increase food security. Moreover, such programs, along with sustainable funding, can educate and empower participants to adapt healthy eating behaviors.

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Evaluating Witness Actions in Response to Out of Hospital Cardiac Arrest

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Introduction

Cardiac arrest (CA) is a leading cause of death in the United States. Bystander actions upon witnessing a cardiac arrest are crucial for survival. Bystander's understanding and actions at the time of an event are not well understood. Our study aims include: 1.) To characterize CA bystander demographics, 2.) To understand the events from patient collapse until EMS arrival, and 3.) Determine bystander level of knowledge/training in CPR.

Methods

This is a prospective observational study conducted on bystanders of out of hospital cardiac arrests (OHCA) serviced by EMS agencies in southeast Michigan. OHCA patients were identified from 3/2018- 12/2019, and bystanders of these events surveyed. Bystanders were mailed an introductory letter and survey, and subsequently interviewed after consent to describe demographics, chronology of events, and their actions during the OHCA. We inquired regarding Telecommunicator-CPR (T-CPR) instructions, and if CPR was not performed what were the barriers.

Results

During our study period 126 surveys were mailed. Of these, 47 surveys were completed. Most events occurred in private homes (37/47,78.7%), and few patients (10, 21.2%) survived to discharge. Average bystander age (range) was 62.9 (30-91). The majority were female 27/47(57.4%), most 43/47 (91.4%) knew the patient and were family (34/47,72.3%). Bystanders knew the patient a median of 32 years. A majority of bystanders (31/47,66.0%) had CPR training and 19 performed CPR. Of the 14/47 (27.8%) that received T-CPR instructions, 9 performed CPR. CPR trained bystanders that did not perform CPR (8/31), identified panic, assessment barriers, and physical reasons for non-performance of CPR.

Conclusions

We identify that bystanders to OHCA are most often family and have known the patient for decades. CPR educational programs should prepare trainees to know that they may well respond to loved ones. Further research characterizing bystanders and their actions are needed to improve cardiac arrest outcomes.

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EMS Related Violence in the Out of Hospital Setting in Southeast Michigan

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Introduction

Protecting the safety of Emergency Medical Service (EMS) personnel from violence in an out of hospital care setting is an important concern. Outside of Southeast Michigan, previous studies have found increased incidence of workplace violence compared to other professions. The primary goal of this study is to determine the prevalence, type of violence, and characteristics of the victims among EMS personnel in Southeastern Michigan.

Methods

Over 1900 EMS personnel from Wayne, Oakland, and Macomb Counties were sent an online survey through the Detroit East Medical Control Authority (DEMCA) asking about their experience with violence while working in the out of hospital care setting within the last 6 months. This survey sought to determine information regarding the prevalence, type of violence, perpetrator, outcome, and any training they received. A \$10 gift card incentive was provided. The study was limited to the first 150 respondents. Data collection ran for 3 months. Descriptive statistical analysis was done with an odds ratio, P-Value, and two samples independent T-Tests analysis.

Results

There were 137 respondents with 55% reporting to be a victim of violence within the last 6 months. Perpetrators were most often patients, however family members were also frequently involved. Substance abuse and/or mental health issues were frequently associated with violence. Females had 5 times greater odds of assault by a coworker (OR= 5.17 95% CI 1.67, 16.0). Paramedics had increased odds to experience unintentional injuries than EMTs (OR= 2.13, 95% CI 1.01, 4.54). 911 respondents had 3 times greater odds to experience violence than non-emergency respondents (OR= 3.14 95% CI 1.38, 7.11).

Conclusions

Over half of responding EMS personnel experienced work related violence within the previous 6 months in Southeast Michigan. Further research and analysis may help guide and improve agency policy that directly affect safety of out of hospital healthcare providers.

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Pornography Use Within a Comprehensive Confluence Model to Predict Relationship Violence

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Introduction

We seek to understand the relationship between pornography use in men and perpetration of relationship violence in the context of the Comprehensive Confluence Model (lays out the convergence of several interrelated factors regarding physical/sexual relationship violence). This could help development of intervention programs to prevent relationship violence by identifying men at risk of perpetrating physical or sexual violence against their partners, and to reduce beliefs and behaviors which may lead to such perpetration in these at-risk men.

Methods

A cross-sectional survey (N=223) analyzed the correlation between frequency/type of pornography use and the perpetration of sexual aggression against women, utilizing Amazon Mechanical Turk for data collection. Participants were asked questions quantifying/qualifying pornography use and perpetration of relationship violence. We tested our hypothesis model as a correlational study using SPSS/MPlus.

Results

The number of days men viewed pornography was not associated with relationship violence. Men who view porn 1+ hour per viewing are 4.26x more likely to perpetrate physical relationship violence (OR: 4.26, $p < .001$) at least once and commit more instances of physical relationship violence ($t(215) = 7.99$, $p < .001$), and are 6.26x more likely to perpetrate sexual relationship violence (OR: 6.26, $p < .001$) and commit more instances of sexual relationship violence ($t(215) = -7.70$, $p < .001$), compared to men who tend to view porn for one hour or less. Men who watched violent porn for more than one hour per session were 10.34 times more likely to perpetrate physical relationship violence (OR: 10.34, $p < .001$) and 18.30 times more likely to perpetrate sexual relationship violence (OR: 18.30, $p < .001$), at least once, compared to men who watched non-violent porn for one hour or less.

Conclusions

The results fit within the Comprehensive Confluence Model as a direct factor in the perpetration of physical and sexual relationship violence.

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Analyzing Medical Student Bias Towards the Homeless Population

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Introduction

Currently, the homeless population faces discrimination and provider bias from healthcare professionals leading to poor health outcomes. The primary goal of this study is to assess the explicit bias of medical students throughout all years of medical school, and to see if learning and interacting with homeless populations as part of the medical school curriculum and prior volunteer experiences impact their perceptions of the homeless population.

Methods

All students at OUWB were recruited through email and asked to voluntarily take the Health Professional's Attitudes Toward the Homeless Inventory (HPATHI). Students were also asked questions about their volunteering hours, gender and exposure to the homeless population prior to medical school. Two-sample-t-test and Chi Square Group Analysis were used to compare the bias in students based on gender, prior volunteer hours, exposure to the homeless population.

Results

Those with more exposure to the homeless had significantly higher agreeing ($P > 0.05$) with the ideas that "homelessness is a major problem in our society", "I entered medicine because I want to help those in need," and "I feel comfortable providing care to different minority and cultural groups." Those that had more than 401 hours of volunteer hours prior to medical school were the ones that still continued to volunteer in medical school. Those with the higher volunteering had a higher score for the personal advocacy score (3.89).

Conclusions

Students with more exposure to the homeless and more volunteer hours had lower bias to the homeless population compared to students with lower exposure and lower volunteer hours. Students were able to gain insight on the homeless population through the OUWB curriculum, their work volunteer work, experiences at the hospital and other extracurricular activities.

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Identifying Homelessness in the Emergency Department

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Introduction

Individuals experiencing homelessness have a multitude of health problems and often utilize the Emergency Department (ED) for basic health care services. However, studies to determine the scope of their needs and methods to provide healthcare to this population are limited by several problems. One of these is simply that there is no uniform protocol for identifying patients experiencing homelessness. The purpose of this study is to determine what, if any, protocols are in place in Oakland County EDs to identify homeless patients.

Methods

This project investigated current protocols for identifying homelessness in patients in EDs in Oakland County. Fifteen EDs in the area were identified and contacted to speak to the appropriate individual who was best positioned to speak to hospital policy regarding homeless patients. A Qualtrics survey was deployed to assess whether different protocols are routinely implemented in their EDs.

Results

15/15 (100%) of ED's reported that they will register a patient without an address. However, only 6/15 (40%) follow a formal protocol to determine if a patient is homeless and slightly fewer (5/15; 33%) train their staff to do so. The majority (12/15; 80%) provide supportive care when a patient identifies as homeless, but combined with lack of standard protocols for identification (noted above), it appears that the tracking of patients experiencing homelessness is relatively rare. In fact, only 2/15 (13%) were able to provide the number of homeless patients in a one-year period.

Conclusions

The results support the idea that appropriate care and social support for patients experiencing homelessness is lacking. Indeed, many institutions are likely failing to capture a significant number of these patients because there is no uniform protocol in identifying homeless patients in the ED. To serve this vulnerable patient population, institutions must implement evidenced-based practices for identifying and then providing case management to patients experiencing homelessness.

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Comparative Management of Homeless Persons With Infectious Diseases in United States Emergency Departments

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Introduction

Studies have long documented the increased emergency department usage in the United States by homeless persons compared to their housed counterparts. Homeless persons also face an increased prevalence of infectious diseases compared to housed persons. However, there is a gap in knowledge regarding the treatment that homeless persons receive for these infectious diseases within United States emergency departments compared to their housed counterparts. This study seeks to understand this potential difference in treatment, including diagnostic services tested, procedures performed, and medications prescribed.

Methods

This study utilized a retrospective, cohort study design to analyze data from the 2007-2010 National Hospital Ambulatory Medical Care Survey (NHAMCS) database, specifically looking at the emergency department subset. Complex sample logistic regression analysis was used to compare variables, including diagnostic services, procedures, and medication classes prescribed between homeless and private residence individuals seeking emergency department treatment for infectious diseases. This provided an odds ratio to compare the two populations, which was then adjusted for potential confounding variables.

Results

Compared to private residence individuals, homeless persons were more likely (OR: 10.99, $p < 0.05$, CI: 1.08-111.40) to receive sutures or staples when presenting with an infectious disease in United States emergency departments. Compared to private residence persons, homeless individuals were less likely (OR: 0.29, $p < 0.05$, CI: 0.10-0.87) to be provided medications or immunizations when presenting with an infectious disease in United States emergency departments, and significant differences were detected in prescribing habits of multiple medication classes.

Conclusions

This study detected a significant difference in suturing/stapling and medication prescribing patterns for homeless persons with an infectious disease in United States emergency departments, compared to their housed counterparts. While some findings can likely be explained by the underlying prevalence of specific infectious organisms in homeless populations, other findings would benefit from further research moving forward.

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Advance Directive Use: Comparing Personal Behaviors and Professional Advocacy

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Introduction

Advance directives (ADs) that detail treatment preferences have been championed by the field of clinical bioethics and by government, medical, and patient organizations as a useful tool for guiding decisions at end-of-life (EOL). Despite unanimous public official support for treatment preference ADs among bioethicists, the bioethics literature highlights various criticisms of these documents, including their lack of specificity and patients' inability to accurately predict their future wishes. This project aims to identify potential tensions between bioethicists' public advocacy and personal practices regarding EOL planning decisions.

Methods

A Qualtrics survey was developed, using a combination of open-ended, Likert scale, and multiple-choice questions. The survey was sent via email to academic and clinical bioethicists at medical schools, graduate programs, and health systems. Survey participants anonymously self-reported their personal behaviors, professional advocacy of EOL planning tools, and their reasons for doing so. Responses were coded by the researchers and descriptive data collected.

Results

213/224 participants (95.1%) reported formally or informally designating a surrogate decision maker, while 153/223 participants (68.6%) reported completing or intending to complete a treatment preference document. Participants also reported various reasons for designating a surrogate decision maker vs. completing a treatment preference document. 216/222 survey participants (97.3%) reported that the professional field of clinical bioethics regards treatment preference documents as somewhat important, important, or very important.

Conclusions

Survey participants were much more likely to designate a surrogate decision maker than to complete a treatment preference AD, even though they recognized that the field of clinical bioethics advocates the use of treatment preference ADs for EOL decisions. These results may suggest a need to reexamine the role of treatment preference documents in EOL care planning.

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Educational Intervention Impact on Analgesic and Antiemetic Drug Expenditure

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Introduction

The Centers for Medicare and Medicaid Services estimates total healthcare spending at 17.9% of Gross Domestic Product in the United States, totaling \$3.3 trillion. Of this, 10% of the spending (\$328.6 billion) are prescription drugs. The purpose of this study is to determine whether providing anesthesiologists and Certified Registered Nurse Anesthetists (CRNAs) with reliable medication pricing information will decrease healthcare spending.

Methods

Anesthesiologists and CRNAs at the Department of Anesthesia at Beaumont Hospital, Troy, Michigan were enrolled via email after an introductory presentation provided by the investigators. Clinicians were provided a laminated index card containing pricing information of common analgesics and antiemetics being studied. Upon completion of the eight (8) week intervention period, the prescribing habits of anesthesiology clinicians were compared to the eight (8) week period immediately prior to the intervention. An Incidence Rate Ratio (IRR) and P-value were provided with statistical analysis.

Results

Average number of Acetaminophen doses increased 36% (IRR: 1.36; P = 0.0005), Hydrocodone-Acetaminophen increased 64% (IRR: 1.64; P = 0.0029), Methadone increased 16-fold (IRR: 15.9; P = 0.0107), and Acetaminophen-Codeine decreased 80% (IRR: 0.20; P = 0.0312). For patients who received at least 1 dose of prescriptions, the average number of Acetaminophen doses increased 27% (IRR: 1.27; P = 0.0008), Fentanyl increased 9% (IRR: 1.09; P = 0.0308), Hydrocodone-Acetaminophen increased 54% (IRR: 1.54; P = 0.0002), Hydromorphone increased 25% (IRR: 1.25; P = 0.0161), Methadone increased 16.3-fold (IRR: 16.3; P = < 0.0001), Tramadol increased 39% (IRR: 1.39; P = 0.0047), and Oxycodone decreased 23% (IRR: 0.77; P = 0.0466).

Conclusions

The results indicate that a drug pricing card intervention did not lead to decreased healthcare spending and in fact, led to increased spending on pharmaceuticals. Further studies should consider alternative methods of medication pricing intervention as a means to reduce healthcare spending.

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Tonic Immobility in Black and Non-Black People of Color During Police Interaction

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Introduction

Despite making up only 13% of the population, Black Americans account for 30% of those killed by the police every year. Cumulative experiences of racial discrimination change how each person will evaluate their own experiences. This distrust can lead to an expectation of violence when police officers intervene and inevitably the experience of tonic immobility.

Methods

200 Black and non-Black people of color over the age of 18 were recruited from Amazon Mechanical Turk (MTurk), the psychology subject pool (SONA), and the metro-Detroit community to complete a questionnaire on Qualtrics. The questionnaire included a tonic immobility scale, attitudes toward police scale, confidence in police index, perceived procedural justice of community police measure, perception of office demeanor, perception of police integrity measure as well as the perception of racial injustice in the criminal justice system scale. Their responses were then analyzed through two factorial ANOVAs.

Results

Results indicated a significant interaction between sex and race on experiences of tonic immobility, $F(1, 392) = 4.85, p = .028$. Black men ($M = 2.32, SD = 1.46$) had a significantly higher level of tonic immobility compared to Black women ($M = 1.83, SD = 1.05$), non-Black men of color ($M = 1.69, SD = 0.93$), and non-Black women of color ($M = 1.71, SD = 1.04$), $F[1, 183] = 7.03$. Results also indicated a significant main effect of race on perceptions of danger $F(1, 398) = 73.29, p < .001$, but a non-significant main effect of sex and a non-significant interaction between sex and race.

Conclusions

This study indicates that there are strong associations between race, sex, and tonic immobility. Understanding these associations and recognizing the signs and symptoms of tonic immobility during these interactions could help deescalate heightened hostility and curb the potential for violence in the future.

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Assessing the Impact of Resuscitation Residents on the Treatment of Cardiopulmonary Resuscitation Patients

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Introduction

The management of cardiac arrest (CA) patients receiving cardiopulmonary resuscitation is an essential aspect of emergency medicine training. At our institution, we have a one-month Resuscitation Rotation designed to augment training in managing critical patients. The objective of this study is to compare 30 day mortality between CA patients with resuscitation resident (RR) involvement versus patients without. Our secondary outcome is to determine if RR involvement altered rates of initiating targeted temperature management (TTM).

Methods

This study was conducted at a single site tertiary care Level-1 trauma center with an Emergency Department (ED) census of nearly 130,000 annual visits. Data was collected from 01/01/2015 to 01/01/2018 using electronic medical records via query. Patients admitted with CA were separated into two groups, one with RR involvement and one without. Initial rhythm of ventricular fibrillation/tachycardia, 30 day mortality, history of coronary artery disease (CAD), and initiation of TTM were compared. Statistical analysis was performed.

Results

Out of 885 patient encounters, 91 (10.28%) had RR participation. There was no statistical difference in 30 day mortality between patients with RR involvement compared to those without (71.42% vs 66.36%; $P=0.3613$). However, TTM was initiated more in the RR group (20.70% vs 8.86%; $P=0.0025$). Patients who received TTM also had a lower 30 day mortality compared to those without TTM (52.94% vs 70.87%; $P=0.0020$).

Conclusions

Resuscitation resident involvement with the care of CA patients had no impact in 30-day mortality. However, the involvement of RR was associated with a statistically significant increase in the initiation of TTM. One limitation is that RR participated in 10.28% of the cases analyzed herein, thus the two arms are unbalanced in size. Future work may investigate if the increase in TTM in the RR involved cases may portend improved rates of neurologically intact survival or more rapid achievement of goal temperatures.

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Outcomes and Costs of Treating Infective Endocarditis: Intravenous Drug Users versus Non-Users

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Introduction

The recent opioid crisis has led to increased intravenous drug use (IVDU) and consequent infective endocarditis. Endocarditis treatment usually entails ≥ 4 weeks of IV antibiotics, and clinical practice guidelines accept outpatient parenteral antibiotic treatment (OPAT) as an efficacious, safe, and cost-effective alternative to inpatient therapy for stable endocarditis. However, it is often not considered for IVDU patients due to a lack of guidelines and concerns over catheter misuse. This study identified the treatment modalities, health outcomes, and costs of treating endocarditis in IVDU versus non-IVDU patients.

Methods

This retrospective chart review included adult patients treated at Beaumont hospitals for native valve infective endocarditis from October 2015 through October 2018. Patients with concomitant IVDU or opioid dependence were compared to patients without evidence of IVDU on the outcomes of interest using chi-square, Mann-Whitney U test, or t-tests.

Results

Compared with non-IVDU patients, fewer IVDU patients were discharged home on IV antibiotics (15.8% vs 34.9%, $P=0.0193$). Patients with IVDU had significantly longer lengths of stay (23.9 vs 12.7 days, $P=0.0031$), were more likely to leave against medical advice (31.6% vs 0%, $P\leq 0.0001$), and were more likely to be readmitted for endocarditis within 12 months (39.5% vs 12.2%, $P\leq 0.0001$). IVDU patients were undertreated for substance use disorder (SUD) both during their admission and in discharge planning. IVDU patients also accrued significantly higher total charges and direct variable costs during their admission.

Conclusions

This study illustrates the current inefficiencies in treating IVDU patients with endocarditis, which includes lengthy inpatient admissions without adequate treatment of SUD, leading to higher treatment costs and increased rates of readmission for endocarditis. It also demonstrates the potential benefits of a comprehensive treatment program that includes addiction services financially offset by the use of a carefully-monitored OPAT program in order to provide more effective and efficient care for this vulnerable and growing population.

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The Impact of Visual Abstracts on Research Dissemination: Triple Crossover Trial

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Introduction

A visual abstract is a graphic summary of a research article's question, methods, and key findings. Although they have a number of uses, visual abstracts are commonly used to increase the reach of research articles on social media. The primary goal of this study is to determine if the use of visual abstracts increases the reach of nephrology research shared on Twitter.

Methods

A prospective case-control crossover study was conducted using 40 research articles published in the American Journal of Nephrology (AJN). Each article was shared by AJN's Twitter account in the following 3 formats: (1) the article citation, (2) the citation with a key figure from the article, and (3) the citation with a visual abstract. Tweet order was randomized, and tweets were spaced 2 weeks apart to allow washout of the previous tweet. Retweets, views, number of link clicks, and Altmetric scores were recorded and used to measure reach.

Results

Tweets that contained a visual abstract had over twice as many views as citation-only tweets (1351, SD 1053 vs 639, SD 343) and approximately twice as many views as key figure tweets (1351, SD 1053 vs 732, SD 464). Visual abstract tweets had 5 times the engagements of citation-only tweets and more than 3.5 times the engagements of key figure tweets. Visual abstract tweets were also associated with greater increases in Altmetric scores as compared to citation-only tweets (2.20 vs 1.05).

Conclusions

The use of visual abstracts increased dissemination of research articles on Twitter, resulting in a greater number of views, engagements, and retweets. Also, visual abstracts were associated with higher Altmetric scores as compared to citation-only tweets. These findings support the broader adoption of visual abstracts in the scientific community.

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Gender Disparity in Speaking Opportunities at a Major Academic Emergency Medicine Conference: Are Women Stuck Under the Glass Ceiling?

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Introduction

This study investigates trends in the representation of female speakers at the American College of Emergency Physicians (ACEP) scientific assembly – the largest academic emergency medicine conference in the world.

Methods

Data was collected from the American College of Emergency Physicians Scientific Assembly's online database from 2016-2018. We collected the title of the presentation, speaker names, duration, and specialty category. Speaker gender was recorded using Google searches and department websites. Using the Elsevier SCOPUS database, we identified h-index, number of publications, and number of times cited. Exclusion criteria were speakers who did not hold an MD or DO degree. We used SPSS to obtain descriptive statistics and perform independent-tests.

Results

Of the 939 invited speakers, 34.3% were women and 65.7% were men. In 2016, there were 340 speakers, 27.1% were female and 72.9% were male. In 2017, there were a total of 296 speakers, women comprising 34.5% of speakers, and men 65.5%. In 2018, women made up 42.2%, and men made up the remaining 57.8%. Presentations given by women were shorter than presentations given by male speakers. In 2016, male presenters had higher h-indices and were cited more times than females (p -value <0.05). The average number of publications did not significantly differ between men and women (p -value >0.05). In 2017 and 2018, male speakers higher h-indices, number of publications, and citations (p -value <0.05).

Conclusions

From 2016 to 2018, there was a steady increase in the proportion of female speakers, with women comprising 42.2% of all speakers at the 2018 conference. Women's presentations also increased in length, on average, from 2016 to 2018. Despite these advancements in representation, male speakers still speak for longer, on average, and make up the majority of presenters. Although women account for a significant portion of the workforce in emergency medicine, efforts to improve female representation in academic emergency medicine are necessary.

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A Comparison Between Personalities in General Surgery Residents and the General Public

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Introduction

Surgical residencies are notoriously demanding for both residents and educators. Due to the demanding nature of these residencies, physician wellness has become a focus of accreditation bodies and surgical societies. Residency programs seek ways to support their residents as they strive to meet the standards required to become competent, independent surgeons. This project aims to contrast the personality trait patterns common to general surgery residents, with those commonly found in the general public. These findings may assist individuals considering careers in general surgery, and also allow educators to better understand their residents and tailor their educational delivery throughout the training process. Additionally, these findings will allow for future exploration of the implication of these trends on clinical practice.

Methods

A validated personality inventory was administered to 17 General Surgery residents. The inventory consisted of 120 items that assessed five primary personality factors: Neuroticism, Extroversion, Openness to Experience, Agreeableness, and Conscientiousness. The residents' inventory results were then compared to inventory data collected from the general public (n=857), housed in a public database. Analyses were conducted using two samples independent T-tests.

Results

The general surgery residents were significantly less neurotic ($p=0.002$), less extroverted ($p<0.0001$), less open to experience ($p<0.0001$), less agreeable ($p<0.0001$), and less conscientious ($p<0.0001$), compared to the general public.

Conclusions

This study shows that the prevailing personality trait distribution present in general surgery residents differs significantly from that found in the general public. Some of these differences are surprising, while some might be expected in a demanding profession. These findings may indicate that individuals with a specific pattern of personality traits may be attracted to a career in general surgery. Further investigation is merited to explain these results and explore how personality traits may be implicated in surgical skill acquisition and patient care.

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Preferences and Perceptions of Patient and Family-Centered Care

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Introduction

In 2016, Beaumont Health announced “Moonshot”, its initiative to be a nationally recognized leader in Patient and Family-Centered Care (PFCC) by 2022. This cross-sectional survey study of elderly volunteers in the Partners in Care (PIC) Program at Oakland University William Beaumont (OUWB) School of Medicine explored the domains of PFCC within the social context of an aging population, in order to enhance understanding of the elderly population’s perceptions of healthcare delivery.

Methods

A previously validated survey used by Wolff and Boyd from John Hopkins University in the observation of the 2012 National Health and Aging Trends Study was adapted for use in this study. Surveys were distributed by mail to 2017 PIC participants, and those returned within a 30-day period were collected and analyzed using descriptive statistics and Fisher’s exact test. Study outcomes focused on the intersection between PFCC and the aging population, through evaluation of attributed overall health and perceived composition of personal healthcare teams.

Results

Our sample consisted of elderly participants (n=72, response rate=55.8%) in the OUWB (PIC) Program, characterized by 2/3 women with half of all individuals ≥80 years of age and 2/3 reaching an educational level of college or beyond. The majority of survey respondents reported an overall health rating of Good (30.0%) to Very Good (42.9%), despite 69% of individuals undergoing hospitalization in the last year. While all respondents included a physician in the composition of their personal healthcare team, less than half (42.3%) reported inclusion of a nurse in their care. Approximately half of all respondents incorporated spouse and children (52.1% and 49.3%, respectively), while the vast majority omitted siblings (88.7%) and close friends (81.7%) from the team.

Conclusions

This study highlights the elderly preferences of PFCC in Oakland County, with special attention to the perceived composition of personal healthcare team, thus informing Beaumont Health’s “Moonshot” initiative.

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Comparison of moFASTER (modified Face, Arms, Stability, Talking, Eyes, React) to FAST for the identification of Posterior Circulation Cerebrovascular Events

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Introduction

Approximately 25% of 795,000 acute ischemic strokes diagnosed yearly in the United States involve the posterior circulation. Given the time-sensitive nature of therapy, many EDs use triage tools like the Cincinnati Prehospital Stroke Scale (CPSS) to rapidly identify/prioritize these patients. Unfortunately, these tools are neither designed to identify posterior circulation strokes (PCVAs) nor validated for use in the ED. As a result, PCVA patients with atypical presentations can be misdiagnosed and/or under-treated. Our objective was to create a novel ED-based stroke triage tool that captures acute ischemic strokes including PCVAs.

Methods

We conducted a retrospective observational trial at our 95,000 visit community hospital ED to describe the ability of our novel moFASTER triage tool to increase the percentage of patients diagnosed with a PCVA. At our institution, standard of care was to use CPSS to guide the triage of these patients. Baseline data were collected from all adult (age > 18 y/o) ED patients with acute ischemic stroke for a three month period in 2016, compared to a three month period in 2017 following implementation of the moFASTER triage tool. Patients were excluded from the analysis if their diagnosis was not based on neuroimaging, either CT or MRI. Our primary outcome measure was difference in number of ED identified PCVAs after implementation moFASTER compared to baseline. Data were analyzed using descriptive statistics and Fisher's Exact to test for significance.

Results

251 ED patients were included, 130 in the baseline cohort and 121 in the after cohort. During the baseline data collection period, 24 patients (18.5%) had PCVA on neuroimaging. After moFASTER was implemented, 38 patients (31.4%) had PCVA. This represented a statistically significant difference with a Fisher's exact of 0.0195.

Conclusions

Implementation of the moFASTER ED triage tool significantly improved identification of PCVAs at our institution.

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Comparing In-Hospital Clinical Outcomes Between Conventional vs. Robotic-Assisted Unicompartmental Knee Arthroplasties

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Introduction

Depending on the extent of compartmental involvement, an arthritic knee can be surgically addressed with a total knee arthroplasty (TKA) or unicompartmental knee arthroplasty (UKA). Despite the more technically-challenging nature, UKAs might provide an appealing alternative to TKAs in younger patients with single compartmental arthritic changes and subsequent pain and functional limitations. Prior studies illustrated that using robotic arms for UKAs improved both accuracy of component alignment and post-operative pain compared to conventional (non-robotic) UKAs. However, few studies have focused on immediate, in-hospital post-operative effects. Furthermore, the aim of this study is to compare the post-operative complications between robotic-assisted and conventional UKAs.

Methods

The National Inpatient Sample (NIS) database was utilized to collect and assess data from 2012-2015 on patients who received robotic-assisted and conventional UKAs. The rates of post-operative complications, including anemia and pulmonary embolism, were assessed and compared between the two cohorts. The Elixhauser Comorbidities Index controlled for comorbidities in patients. Chi-square tests to analyze categorical data and odds ratios for data that examined in-hospital, post-operative complications were performed.

Results

A total of 16,950 robotic-assisted and 2,414,609 conventional UKAs were analyzed. Adjusting for Elixhauser comorbidities, the rate of any complication (post-op anemia, DVT, PE, wound infection, or deep infection) was 19.17% among the robotic cohort compared to 22.62% in the conventional group, p-value 0.3940. The rate of any complication expanded (GI, GU, cardiovascular, or respiratory complications) was 19.81% in robotic-assisted UKAs compared to 23.51% in conventional UKAs, p-value 0.3586.

Conclusions

This study showed a lower rate of post-operative complications in robotic-assisted UKAs, but the difference did not reach statistical significance. The results could be impacted by the substantially lower number of robotic-assisted cases compared to the conventional cohort. Further studies with larger robotic-assisted UKA sample sizes should be completed to validate the potential findings in this study.

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Early Predictors of In-hospital Mortality in Patients With COVID-19 in a Large American Cohort

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Introduction

Coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection has rapidly spread across the world and very little is still known about its' clinical course or risk factors indicative of mortality. This study aimed to distinguish the main characteristics and identify the early predictors for mortality among patients hospitalized with COVID-19. Understanding these risk factors can help clinicians develop management strategies.

Methods

This was a multicentered cohort study conducted on hospitalized patients that tested positive for COVID-19. Data was extracted from the electronic medical records, including epidemiological, demographic, clinical, radiographic, and laboratory results. A multivariable survival regression analysis was conducted on the data collected from COVID-19 positive patients who were hospitalized between March 1st and March 31st, 2020, and met all additional inclusion criteria.

Results

Of 1629 consecutive hospitalized adult patients with confirmed COVID-19, 1461 patients were included in the final analysis. 327 patients died during hospitalization and 1134 survived to discharge. The median age was 62 years (IQR 50.0, 74.0) with 56% of hospitalized patients under the age of 65. 53% were male and 63% identified as African American. Most patients (55%) had ≤ 1 comorbidity. In multivariable analysis, older age, admission respiratory status including elevated respiratory rate and oxygen saturation $\leq 88\%$, and initial laboratory derangements of creatinine > 1.33 mg/dL, alanine aminotransferase > 40 U/L, procalcitonin > 0.5 ng/mL, and lactic acid ≥ 2 mmol/L increased risk of in-hospital death.

Conclusions

Our analysis revealed that older age, low oxygen saturation and elevated respiratory rate on admission, and initial lab derangements including renal and hepatic dysfunction and elevated procalcitonin and lactic acid are risk factors for in-hospital death. These findings will help clinicians to identify patients at a higher risk for an adverse outcome as well as inform their decisions on patient management.

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Evaluating a Healthcare Navigation Guide for Young Adults With Autism Spectrum Disorder

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Introduction

Young adults with Autism Spectrum Disorder (ASD) often exhibit characteristics including: communication difficulty, sensory sensitivities and focused interest. With prevalence of ASD estimated at 1% of the population, the number of ASD adults treated by healthcare providers may increase precipitously in the future. Therefore, it is crucial to identify methods for improving the quality of healthcare for this population. This project seeks to understand the effectiveness of an existing online healthcare guide in assisting high-functioning young adults on the spectrum during their transition from pediatric to adult healthcare.

Methods

The study collected feedback from four in-person focus groups consisting of either young adults (ages 18-35) with ASD or parents/guardians/caregivers of young adults with ASD. Four criteria were analyzed for an existing online ASD guide: accessibility, usability, the potential to share ASD information with the patient's healthcare providers, and indication of future utilization. Focus group transcripts were analyzed for recurring themes.

Results

Ten young adults and four parents/guardians/caregivers were interviewed. All young adult respondents queried about these specific issues indicated that they had some difficulty accessing the guide and found it potentially usable for sharing personalized ASD information with their healthcare providers. All parents/guardians/caregivers found the guide functional and anticipated use by their young adult. Suggestions for improvement include: improving the accessibility of the flyer online, having the flyer presented in more ASD settings, improving the multimedia functionality on all devices, and adding more opportunities to indicate specific sensitivities and additional personalized information on the guide's forms.

Conclusions

This study indicates the existing online guide assessed provides an effective means for young ASD adults to identify and communicate their health care needs to a physician. The findings also serve as a foundation for refinement of the guide and support for future dissemination through ASD programs and online platforms.

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A Self-Forgiveness Intervention for Obstetrics and Gynecology Patients

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Introduction

Many pregnant and postpartum women experience guilt during pregnancy, which makes it difficult to achieve self-forgiveness and has been found to be a predictor of postpartum depression. Despite a few interventions developed for the general population, no self-forgiveness interventions have been designed for pregnant and postpartum women. This study will evaluate the effectiveness of a guided imagery meditation in facilitating self-forgiveness and alleviating guilt in pregnant and postpartum women compared to non-pregnant women.

Methods

Female participants (aged 18-45) who are currently being seen in the Obstetrics & Gynecology Department at Beaumont Hospital will be divided into two groups: 1.) non-pregnant and 2.) pregnant or postpartum. Flyers will be posted in Beaumont Hospital, and all eligible and interested participants will be emailed the link to a Qualtrics survey. Before and after listening to the self-forgiveness intervention, participants will complete 4 questionnaires: Heartland Forgiveness Scale, State Self-Forgiveness Scale, State Shame and Guilt Scale, and Edinburgh Postnatal Depression Scale. Data will be analyzed for significant correlations via pre/post two-tailed t-tests.

Results

9 participants were recruited for this study: 2 pregnant women and 7 non-pregnant women. Overall, there was no significant effect of the intervention in facilitating self-forgiveness, alleviating guilt, or reducing the risk of perinatal depression ($p \geq 0.05$). However, there was a significant difference in change in self-forgiveness on the HFS scale between the two groups ($p = 0.0497$).

Conclusions

Despite a qualitative improvement in self-forgiveness and reduction of guilt after the intervention, these results were not significant, likely due to the small sample size. However, the qualitative improvement suggests that this intervention could be used to facilitate self-forgiveness and alleviate guilt, which could have significant health benefits. Future directions for this study could be to utilize a larger sample size or to evaluate the long-term effect of this intervention on self-forgiveness.

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Threshold Concepts in Preclinical Medical Education

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Introduction

Threshold concepts are those ideas that learners often find difficult, but must understand in order to master a discipline. There has been very little research into threshold concepts in the medical school curriculum, especially from the perspectives of students. Medical physiology has often been a challenging core topic for medical students. The goal of this study is to better understand what students considered to be threshold concepts in physiology so teachers can better address the learning needs of students.

Methods

Volunteers from a medical school were recruited and three focus groups were conducted during the preclinical years. Each focus group consisted of 7–8 students. The focus groups began with a brief introduction of what threshold concepts are followed by the presentation of a brief clinical case. The students were given a case that integrated knowledge that had been taught in organ system courses prior to the focus groups. Students were asked to come up with a differential diagnosis and suggestions for underlying pathophysiology. After this, they were allowed to ask questions to gather a history and explain the underlying physiological concepts that led them to their differential diagnoses. A fourth focus group was conducted in the early weeks of the clinical years and after USMLE Step 1 examination. Following all focus groups, the audio was transcribed and thematic analysis was conducted.

Results

Based on the four focus groups conducted, several potential candidate threshold concepts emerged including secondary messenger pathways, Starling forces, preload and afterload, and cell membrane potentials.

Conclusions

This study identified a set of candidate threshold concepts in medical physiology from the students' perspective. Further characterization of these candidate threshold concepts can be used as a foundation for designing an effective and powerful physiology curriculum.

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Assessment of a Video Game for Anatomy

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Introduction

There is a need for generating interactive educational tools that promote self-directed learning in medical school. Due to the abundance of educational resources available to medical students, the creation of learning tools aims to simplify the learning process and to help students efficiently assess their knowledge. Here, we present the development of an innovative and Interactive Learning Tool for Anatomy (MedAnatomy) and the preliminary results of its effectiveness.

Methods

We developed a software that contains material for the arm, in which the upper arm section was evaluated for this study. Medical and non-medical students will be recruited to participate in this research, to assess the MedAnatomy quality in promoting anatomical learning. Participants will play each level four times, plus a pre- and post-test, to measure its effectiveness. Also, participants will complete two surveys to assess the effectiveness of learning tools and how certain traits align with in-game performance.

Results

Based on preliminary data, there is a significant increase in the mean scores of the pre- versus post-test. Also, the trends demonstrate that players reach a similar optimal score for each level after the second attempt. Lastly, the trends demonstrate across all levels that all participants are completing the levels in similar times.

Conclusions

The preliminary data is demonstrating the efficacy of the MedAnatomy tool and its ability to increase knowledge, as demonstrated by the pre-test versus post-test scores. Current data demonstrates that experience level is not a factor in the overall scores or the time requirement for participants. It appears that participants are able to optimize scores and times in as few as two attempts throughout each of the levels. Moving forward, we will analyze how quickly participants maximize their scores and study the survey responses to assess the quality of MedAnatomy.

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A look into Medical Students' Knowledge on Adverse Childhood Experiences

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Introduction

Adverse childhood experiences (ACEs) are defined by the Center for Disease Control and Prevention as traumatic events that occur from birth to 17 years old that involve abuse, neglect, and household violence. Literature has shown that ACEs are linked to various mental and physical health consequences, thus it is imperative that providers are given early education on how to identify and care for these patients. Currently, training on ACEs is lacking in most medical school curricula. The aims of this study were to assess medical student knowledge of ACEs and confidence in caring for patients with them.

Methods

Students at a midwestern allopathic medical school were asked to complete an anonymous survey on their knowledge and experiences with ACEs.

Results

83 out of 494 (16.8%) completed the survey. Although 68% of students were able to correctly determine what ACE stands for, only 13% were able to correctly identify situations that constitute an ACE. While most identified scenarios dealing with physical abuse/neglect as ACEs, emotional stressors were missed by 77% of students. 45% had experiences with ACEs in the clinical setting. Only 22% of students considered themselves confident in screening patients and only 21% of students felt confident in treating patients with ACEs. There was no statistical significance with any variables in the study with time periods of exposure (all $P > 0.05$).

Conclusions

This study identified a lack of knowledge and confidence among students in regards to what ACEs are, what types of scenarios constitute ACEs, and how to treat patients with them. With the overwhelming evidence of future health complications associated with ACEs, it is of paramount importance for future physicians be taught to screen and care for patients with this history. This study will encourage medical educators to incorporate teachings about ACEs early on in medical school.

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Optimization of School Reintegration for Pediatric Oncology Patients and Their Peers

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Introduction

Favorable survival rates in pediatric oncology allow the opportunity for patients to return to school, during or after treatment. This can be a significant challenge, exposing vulnerability to peer rejection. Successful school reintegration for these children is integral to their academic advancement as well as achievement of normal psychosocial milestones. The objective of this double-arm descriptive study was to establish a framework from which to optimize a school reintegration intervention for the peers of pediatric oncology patients.

Methods

This study utilized age appropriate surveys to evaluate the knowledge and concerns of 3rd-8th grade students in Michigan regarding friends with cancer and to identify concerns of pediatric oncology patients at a Michigan practice regarding return to school during or after cancer treatment.

Results

The majority of 3rd-8th grade students correctly answered questions related to etiology, prognosis, side effects, and treatment of cancer. Respondents in 3rd-5th grade were significantly more likely than 6th-8th graders to endorse the perception that cancer is contagious ($P = 0.0036$). Fewer students who had a friend with cancer were worried that their friend might die, compared to those who did not have a friend with cancer (3rd-5th graders [$P = 0.0002$] and 6th-8th graders [$P = < 0.0001$]). A common theme from patients was a desire to be given extra support without being singled out from their peers.

Conclusions

Results suggest that peer intervention may be optimized via customization based upon student concerns rather than focusing on cancer education. Additionally, personalized interventions and assistance for patients should strive to reduce stigma and differentiation from other students. Programs that do not already offer academic assistance, support groups, and peer education should consider adding these elements for successful return to school.

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Cloud-based Learning: An Interactive and Team-based Teaching Strategy

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Introduction

Medical students today use technology more frequently than ever before. Integrating technology using a conceptual theoretical framework, such as Technological Pedagogical Content Knowledge or TPACK, together with generative learning theory would create a unique and strong environment for learning. Tuberculosis (TB) remains an important public health concern worldwide. It is important to provide high quality instructional sessions to medical students about the pathogenesis of TB, as medical students are likely to encounter TB infections in clinical practice. We hypothesize that integrating immunology and microbiology concepts about TB in a session designed using TPACK and generative learning will promote student learning and engagement.

Methods

We created an interactive instructional session for the topic of Mycobacterium tuberculosis that allows learners in groups to collaborate using cloud-based technology. The session was delivered to first year medical students in the respiratory organ systems course at OUWB. This method includes real-time formative feedback from faculty to students, and allows students to create their own study content. We evaluated the session with pretest and posttest scores as well as an optional student questionnaire. The data from the pre- and posttests were analyzed using a paired t-test with a 0.001 two-sided significance level.

Results

Cloud-based learning (CL) received high student satisfaction ratings (83%; n=112). When compared to other teaching methods, CL provided significantly higher instructor feedback than team-based learning (TBL), didactic lecture (DL) and flipped classroom (FC) strategies while TBL provided significantly higher peer feedback than CL. The students had an absolute increase in their scores by 31% on the posttest as compared to the pretest ($p < 0.001$).

Conclusions

We developed and evaluated an interactive instructional design using a cloud-based platform that allows medical students to learn content with limited preparation time. CL provides instant feedback, promotes collaboration, and aligns with TPACK and generative learning frameworks.

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Feminine Health Education Among Women Experiencing Homelessness

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Introduction

Exposure to pathogens and limited access to preventative health care yields high infection rates among individuals experiencing homelessness. Research suggests the prevalence of non-sexually transmitted genitourinary infections in homeless women may be very high, and that homeless women may lack education about related preventative practices. This research aims to deliver and evaluate a health education session on vulvovaginal health and recommended hygiene practices to women at a low barrier homeless shelter.

Methods

Using validated resources, a novel educational presentation centered on sexually and non-sexually transmitted infections, untreated infection consequences, preventative practices for vulvovaginal health, and female genital anatomy vocabulary was delivered. A survey of factual knowledge and attitudinal items was used to assess change in knowledge and confidence in answer selection. All analyses utilized a bootstrapped sampling distribution and the reported p values are corrected accordingly. One outlier, who also failed to literacy screening question, was removed to yield a sample of 18.

Results

The pre-session mean score was 14.8889 +/-3.28 with post-session mean 17.7778 +/-3.19. The mean of score increase of 2.89 (t=5.218, p=0.002) showed statistically significant knowledge increase. The mean confidence score was 3.9563 +/-0.99 before the intervention and 4.5005 +/-0.64 following the intervention; the 0.51 point increase was statistically significant (t=3.71, p<0.01). A corollary probability test using a binomial distribution showed the increase in score of 15 out of 18 participants is highly unlikely to be due to random sampling error (p<0.01). There was not a statistically significant difference in pre-session score, post-session score, or score change associated with different age groups or education levels.

Conclusions

Participation in a health education session improved the knowledge of women experiencing homelessness regarding vulvovaginal health and hygiene. This suggests short educational sessions may be an effective remedy for knowledge gaps within this population.

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Evaluating Treatment Adherence Training Among Medical Students: A Pilot Study

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Introduction

Each year, second-year medical students undergo a Treatment Adherence module taught during their Behavioral Sciences unit. This module is a half-day, low-stakes program that begins with a lecture and ends with a standardized patient and preceptor accompaniment. The purpose of the module is to provide medical students with strategies to improve treatment adherence outcomes among their future patients. This study assesses student satisfaction, knowledge retention, perception of modules, and application of clinical skills at various time points between M2 and M3 years. It aims to determine the effectiveness of these trainings and hypothesizes that the current module will train preclinical students to improve treatment adherence outcomes throughout their clerkships.

Methods

125 second-year medical students (M2) from a suburban medical school completed a Treatment Adherence Module as a fulfillment for their Behavioral Sciences unit. The study employed a time series, cross-sectional design with convenience sampling. Students were given the option to take a 5 minute, pre and post survey. The class was followed up 3 months into their third-year (M3) rotations, and were asked to take an additional post survey. Participants were evaluated on their baseline knowledge of treatment adherence strategies, as well as their overall satisfaction with the module, and assessed for their post-intervention knowledge and experience in improving treatment adherence outcomes. A paired t-test will be used to analyze the collected results.

Results

Compared to the M2 pre-intervention group, the M2 post-intervention group ($n=45$) 7.49 ± 4.15 , $p < 0.001$ and M3 post-intervention group ($n=45$) 2.84 ± 4.54 , $p < 0.001$ exhibited greater comfort level and application of treatment adherence skills.

Conclusions

The results support the hypothesis that maintaining the current Treatment Adherence module as a low-stakes assessment is sufficient to train medical students to apply these skills throughout their clerkships.

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Continuing Medical Education for Primary Healthcare Providers Treating Young Adults with Autism

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Introduction

National data indicates that 66,000 individuals with Autism Spectrum Disorder (ASD), turn eighteen annually; therefore, many primary care providers will likely treat ASD patients. Previous studies indicate that knowledge of ASD, along with appropriate appointment- and patient-specific accommodations, can improve health care delivery.

Methods

A module was developed describing typical ASD behaviors, including clinical approaches to enhance the health care experience. The module was distributed to primary healthcare providers. Efficacy for increasing knowledge and awareness of ASD was assessed through paired t-tests of pre- and post-module survey results.

Results

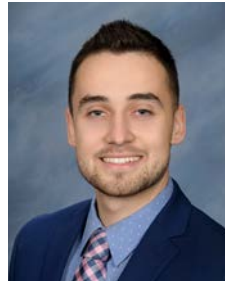
Forty-one primary care providers chose to enroll in the research study online and eighteen providers, including residents, attended an in-person presentation of the module. 94% of respondents indicated that the module increased their knowledge and awareness of autism. Respondent familiarity with the challenges that patients on the autism spectrum face when transitioning to adult primary care increased significantly after viewing the module ($p < .001$), with online participants increasing to 100%. Further, participants reported an increase in their likelihood to make accommodations for patients with ASD after completing the module ($p < .001$), including 100% of online respondents stating they would make accommodations. Regarding approach to delivery of care for a patient with ASD, 93% of participants stated they would take a different approach, geared towards the ASD patient ($p < .001$). Further, 87% of all respondents indicated that they would alert their staff if a patient has ASD, a significant increase compared to before viewing the module ($p < .001$).

Conclusions

This study suggests that a module providing ASD information and potential patient-related accommodations may increase provider awareness regarding how to improve health care delivery for this population. It may, therefore, be warranted for primary care providers to have access to this information prior to treating patients with ASD.

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Efficacy of Directed-independent Learning Module on the Complement System

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Introduction

There is a need for generating interactive educational tools that enhance directed-independent learning outside the classroom in medical schools, especially in topics that require extensive factual memorization. This allows instructors to optimize in-class time engaging higher order cognitive skills rather than spending time delivering factual information. Our goal is to create an educational module that is interactive, entertaining, improves knowledge about the topic, and helps students self-assess their progress.

Methods

First-year medical students at OUWB were provided with twenty-five YouTube videos, activities, and multiple-choice questions for a pre- and post-test through Softchalk. A Likert scale survey (1 to 5) was then created in Qualtrics to determine satisfaction. Data was collected over two consecutive academic years (2018 and 2019).

Results

There is a significant increase in average mean between pre- and post-formative assessments [N=86; Pre = 2.60 (SD=1.55) vs. Post = 4.16 (SD=0.88)]. There is a significant self-reported increase of proficiency in immunology [N=66; 1.76 (SD=0.63) to 2.74 (SD=0.64)], as well as the complement system [N=66 (before) and 29 (after); 1.5 (SD=0.61) to 3.21 (SD=0.82)]. Participants ranked the online module highly (1 = not at all to 5 = a lot) in their likeliness to recommend to other students [N=28; 4.68 (SD=0.55)], clinical relevance [N=28; 4.39 (SD=0.83)] and help for future class exams [N=28; 4.25 (SD=0.70)]. Participants rated the module highly (1 = very poor to 5 = excellent) for satisfaction with the videos [N=65; 4.00 (SD=0.90)], multiple choice questions [N=65; 4.12 (SD=0.91)], and comparison to other modules [N=65; 3.92 (SD=1.02)].

Conclusions

Proficiency for both immunology and the complement system through both objective and self-reported measures increased after exposure to the module. Participants were also highly satisfied with the module, indicating it would be beneficial to continue utilizing directed-independent learning.

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Determining the Effectiveness of an Etymological Learning Tool

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Berkley J. Browne, Ph.D.³, Judith M. Venuti, Ph.D.²

Introduction

Embryology poses problems for medical students because it introduces them to complex novel terminology. We propose understanding their etymological origins, leads to a better understanding of embryological terms. To test this, we undertook a mixed-methods project to design, implement and assess a resource, the etymological dissection approach (EDA).

Methods

Data from Class of 2021 focus groups (n=17) was analyzed using NVivo software and guided content, timing, and mode of delivery of the resource. It recommended a pre-matriculation EDA worksheet and an application workshop for incoming students. In Fall, 2019, we delivered an EDA worksheet to incoming students and asked they complete a survey to determine their prior knowledge of embryology, languages, medical terminology, etc. A workshop was delivered the 1st week of classes that walked students through the EDA steps: Connect, Deduce, Confirm, Understand, and Integrate. Students were encouraged to use the resource and complete a post-survey at the end of the 1st semester.

Results

Pre-survey data revealed students had little to no prior embryology knowledge. 55% of students reported fluency in Spanish, but little to no familiarity with Greek (1%) or Latin (7%). Students reported sometimes applying (2.327 +/- 1.203; 1= never; 5= always) a similar technique to the EDA, perhaps because 17% have taken medical terminology. Students found the EDA worksheet useful (3.051 +/- 0.972; 1=not at all useful; 5=extremely useful). The post-survey suggests students found the EDA moderately useful. Further analysis could determine if students attended the workshop, used the EDA afterwards, and how efficacious the EDA technique was for understanding and retention of terminology.

Conclusions

The EDA appears to help students with embryology terminology and can be applied to other disciplines. The EDA provides a tool that can be added to a medical student's skillset and used throughout a career requiring life-long learning.

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Improving Ethical Training for Medical Students' Global Health Experiences

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Introduction

The field of global medical education is gaining interest and attention. A 2016 study by Rahim et al. outlined various examples of complex ethical challenges that students face on international health electives such as being asked to exceed their clinical competence, responding to culturally inappropriate behavior of fellow students, responding to corruption, etc. The current study aims to understand the specific ethical challenges medical students from Oakland University William Beaumont School of Medicine (OUWB) encounter during global experiences. Additionally, this study will evaluate how prepared students felt for encountering these challenges based on their ethical training in the Medical Humanities and Clinical Bioethics (MHCB) course at OUWB.

Methods

In this study, ten OUWB medical students who previously participated in an OUWB-sponsored or self-identified international rotation while they were enrolled as students at OUWB were interviewed. The semi-structured interviews used a combination of open-ended questions and case vignettes to elicit students' experiences with, and responses to, complex ethical challenges. The interviews were transcribed, then coded and analyzed using NVivo software.

Results

In this study we found that the most common ethical challenges people experienced or witnessed on their global experiences were scarce resources and managing differing social norms. Additionally, all students stated that exceeding clinical training was a possible challenge, but none were put in this position on their rotations. All 10 respondents said they believed MHCB prepared them well by encouraging them to know their limits, emphasizing sustainability of host organizations and encouraging cultural humility.

Conclusions

This study identified the common ethical challenges medical students experienced on global rotations and found that students felt well prepared for these experiences by the OUWB MHCB course. This project could encourage other schools to adopt similar ethical training models.

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The Effect of Spatial Ability on Medical Student's Preferences in Residency

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Introduction

By the end of medical school, each student must choose a specialty which will dictate the type of medicine that they will practice for the rest of their career. Studies have examined the external factors that influence student choice (salary, schedule, work/life balance, etc.) yet little is known about the role that cognitive and perceptual factors, such as spatial ability, have on specialty choice. The objective of this project was to determine if there is a relationship between participant mental rotations ability and specialty preference.

Methods

Medical students (n=51) were recruited to participate. Participants completed a survey that included demographic information, open ended questions, and an Everyday Spatial Abilities Test (ErSAT) to measure participant's perception of their own spatial abilities. Participants' spatial ability was then assessed using the Mental Rotations Test (MRT). Participants were also asked to view a complete list of specialties, and rank their "top five" preferred options. Participants were then assorted into high and low spatial ability groups, according to both ErSAT scores and MRT scores. Specialty distributions were then compared across high and low groups using a two-samples independent T-test.

Results

Participants ranking Family Medicine most preferred specialty had lower average MRT scores (8.33) than those who did not (16.24) ($p=0.0283$). Those who ranked Physical Medicine and Rehabilitation preferred Physical Medicine & Rehabilitation (PM&R) as a top 5 specialty had an average MRT score of 21.20, different from those who did not rank PM&R top 5 had an MRT average of 14.13 ($p=0.0001$).

Conclusions

This study was limited by small sample size and the large amount of possible specialties (n=26). Because of this, many specialties were selected by no or few participants, leading to low power. A larger cohort with diverse specialty preference would help to further illustrate relationships between MRT ability and specialty preference.

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Coffee Shop or Lecture Hall: Exploring OUWB Students' Motivations for Lecture Attendance

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Nina Diklich, B.S.¹

Introduction

Medical students are adult learners that have a variety of motivations for attending class in person. Self-determination theory (SDT) provides a framework to understand these motivations, positing that needs for competence, autonomy, and relatedness drive these decisions. We applied these well-established theories to medical students' lecture attendance to quantitatively elucidate student motivations and guide future educational practices.

Methods

OUWB Medical School Government (MSG) conducted a voluntary survey of all medical students enrolled in Fall 2018. A total of 239 students across all 4 classes answered at least one of the survey questions. Survey questions used 5-point Likert scales (1=strongly disagree, 5=strongly agree) to measure how certain factors influenced students' decisions to attend or not attend preclinical lectures. We applied self-determination principles post-hoc to these data, calculating descriptive statistics for autonomy, competence, and relatedness categories.

Results

Eligibility for an honors grade was the top-ranked reason to attend lecture, with a mean of 4.47 and a standard deviation of 1.02. Further popular reasons to attend included a sense of community (3.84, 1.21) and enthusiastic instructors (3.75, 1.12). Leading factors to not attend lectures were to study independently for the given course (4.1, 1.17), belief that lecture attendance was not necessary to pass the course exam (4.07, 1.15), and that the material in lecture was poorly presented (3.89, 1.16). The competence subgroup had high means in both directions of lecture attendance.

Conclusions

Competence factors rated highly in both reasons to attend and not to attend lecture. Students demonstrated self-efficacy in their belief they could digest course content and pass exams without attending lecture, signifying a wide range of learning styles. Preclinical education should encourage students to exercise their autonomy over their learning styles, while connecting with peers and instructors when needed in order to foster motivation and enhance performance and wellness.

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Integrative Module Improves Pathology Self-Efficacy for Students with Lower Course Scores

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Said Hafez-Khayyata, M.D.^{1,3}, Stefanie M. Attardi, Ph.D.²

Introduction

Integration of core concepts is an important aspect of medical curriculum enhancement. Oakland University William Beaumont School of Medicine sought to better integrate histology with pathology in a respiratory course. Computer-based module use for independent study improves performance and receives positive feedback in integrated basic medical science curricula and pathology instruction. The study objectives were to design and implement a histology module that prepares students for a pathology laboratory session; determine if the module facilitated short-term knowledge gain; and determine if module use or previous course performance affected pathology self-efficacy.

Methods

First-year medical students were invited to complete an online histology module before their mandatory pathology laboratory. A validated self-efficacy survey modified for histopathology skills was administered to participants prior to the module and laboratory. To determine incoming student performance, pre-study course assessment scores were obtained. Wilcoxon signed rank and Mann Whitney U tests were used to assess differences in module quiz scores and self-efficacy, respectively, with alpha <5%.

Results

Post-module quiz scores were significantly higher than pre-module scores ($n=32$, $p=0.002$). Pre-laboratory self-efficacy was significantly higher than pre-module self-efficacy in module users ($n=12$, $p=0.008$). Among top-half performers, there was no significant difference in pre-laboratory self-efficacy between module users ($n=9$) and non-users ($n=10$) ($p=0.90$). Among bottom-half performers, module users ($n=5$) reported significantly higher self-efficacy than non-users ($n=9$) ($p=0.03$). Among module users, there was no significant difference in self-efficacy between top-half ($n=9$) and bottom-half performers ($n=5$) ($p=0.44$). Among non-users, top-half performers ($n=10$) had significantly higher self-efficacy than bottom-half performers ($n=9$) ($p=0.01$).

Conclusions

Module use facilitated short-term knowledge gain and improved pathology self-efficacy. Module use correlated with significantly higher self-efficacy among lower performers compared to those that did not use the module. These findings suggest that modules of this nature may be of greater benefit for students who initially have lower academic performance.

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Exploring the Efficacy and Student Perceptions of Exposing Medical Students to Relevant Ultrasound Anatomy Concepts using Simulated Ultrasound

Hosameddine Talab, B.S.¹,
Malli Baremkala, MBBS²

Introduction

Ultrasonography is an already widely used diagnostic tool in a wide variety of specialties whose prevalence and applicability continues to grow. However, the integration of ultrasound into the anatomy curricula of U.S. medical schools has varied from school to school in terms of depth of content and methods of delivery. The primary aim of this study was to determine if introducing first and second year medical students to some of the basics of visualizing and interpreting ultrasound anatomy using an ultrasound simulator would be both effective and well received.

Methods

At the beginning of the semester, three online learning modules covering ultrasound topics as they relate to the AFCP course were made available to the first-year medical students. Each online module had a video demonstrating ultrasound image acquisition techniques and image interpretation, as well as an attached pre- and post-module quiz to allow investigators and the student to assess their learning from the module.

Results

Online modules were distributed to 125 first year medical students via Qualtrics. 8 of 125 (6.4%) first year medical students consented to the project. All the students took the pre-module quiz while only 3 students complete the post-module quiz. The amount of time spent on the modules varied from 30 sec. to 10 min. Students who watched the modules showed a consistent increase in the scores. While not statistically significant, there is a correlation between watching the modules and increase in post module quiz score.

Conclusions

We were not able to obtain the number of participants needed to achieve a measure of statistical significance needed to ascertain if the modules made a positive contribution to student learning of ultrasound basics. The project did however serve to set a precedent for the integration self-directed ultrasound learning at OUWB.

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Identifying Healthcare Provider Accommodations for Adult Patients with Autism Spectrum Disorder

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Mary O. Dereski, Ph.D.²

Introduction

Each year 66,000 patients with Autism Spectrum Disorder (ASD) turn 18, yet there is little information on the type of care these adult patients receive during their transition to an adult health care provider. This pilot project attempts to ascertain healthcare delivery preferences and potential accommodations implemented by physicians who currently treat young adult ASD patients.

Methods

Physicians who currently or previously treated adult patients with ASD were identified by contacting Family Medicine, Internal Medicine, and Internal medicine/Pediatrics providers in Southeast Michigan. Participating physicians were met in person for a brief interview in a private location of their choice. Responses were qualitatively evaluated for common themes as well as similarities and differences in responses.

Results

Three physicians were interviewed (1 Family Medicine physician [FM] in a small private practice, 1 FM in a large teaching hospital clinic, and 1 Internal Medicine/Pediatrics physician). All participants stated they did not have a current protocol for ASD patients; did not obtain information from the patient's previous physician; or instruct their clinical staff to make accommodations for these patients. Participants also indicated that identifying an adult patient with ASD is difficult, may happen by chance and there is no tool to assist with awareness that they are treating an adult ASD patient. The large practice FM physician indicated that "they weren't taught on how to intervene [when encountering an adult ASD patient]". All expressed interest in viewing a Continuing Medical Education module on the topic.

Conclusions

This study identified the lack of a common approach to providing primary healthcare to adult ASD patients. It also indicated that an accepted "standard of care" is absent for providing primary care to an adult ASD patient. These findings underscore the need for medical education programs presenting best healthcare practices for this growing adult patient population.

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Class of 2021

**Embark Competitive Mini-Manuscript
Scholarship Recipients**

**Ann V. Nicholson Embark Program
Manuscript of the Year**

David Lee

*Assessing the Impact of Resuscitation Residents on
the Treatment of Cardiopulmonary Resuscitation Patients*

**Ravitz Foundation Embark Program
Competitive Scholarship, Manuscript
of the Year Runner-Up**

Nikhil Mankuzhy

*Prognostic Significance of Neuroendocrine Differentiation
in Prostate Adenocarcinoma with Distant Metastasis*

**Newman Family Foundation Embark
Program Competitive Scholarship**

Nikta Khajeh

*Assessing the Prevalence of Sport-Induced Urinary Incontinence
and its Emotional Impact on Female Gymnasts*

**Ravitz Foundation Embark Program
Competitive Scholarship**

Patricia Fuentes

*Hippocampus Segmentation on non-contrast
CT using Deep Learning*

Nahrain Putris

*Activation of p38-MAPK is Required for VEGFA165-induced
Migration, but not Proliferation, of Primary Human Retinal
Microvascular Endothelial Cells*

Christos Sarantopoulos

*The Role of Human Macrophage Histone Deacetylases in
Inflammation and Disease: A Systematic Review*

Daniel Schoenherr

*Integrative Module Improves Pathology Self-Efficacy
for Students with Lower Course Scores*

Class of 2021

**Oakland University Credit Union
Dean's Choice Award**

1st Place

Nikta Khajeh

*Assessing the Prevalence of Sport-Induced Urinary Incontinence
and its Emotional Impact on Female Gymnasts*

2nd Place

Jessica Barnes

*Comparative Management of Homeless Persons With
Infectious Diseases in United States Emergency Departments*

3rd Place (tie)

Aryana Sharrak

Understanding Opioid Addiction in the Chaldean Community

3rd Place (tie)

Bhavneet Singh

*Comparing In-Hospital Clinical Outcomes Between Conventional
vs. Robotic-Assisted Unicompartmental Knee Arthroplasties*

Class of 2021 Embark Program Scholarly Activity

Yousef Abdulla

Kawak, S., DeMare, A., Reilly, D., Abdulla, Y., Studzinski, D., & Ziegler, M. (June, 2020). Implementation of A Food Insecurity Questionnaire for ERAS Colorectal Patients Poster presented at: American Society of Colon and Rectal Surgeons Annual Scientific Meeting (Virtual); Boston, MA, USA.

Reilly, D., DeMare, A., Kawak, S., Abdulla, Y., Studzinski, D., Zeigler, M. (May, 2020). Implementation of A Food Insecurity Questionnaire for ERAS Colorectal Patients Poster presented at: Virtual 2020 Michigan Summit on Quality Improvement & Patient Safety; Online, MI, USA.

Reilly, D., DeMare, A., Kawak, S., Abdulla, Y., Studzinski, D., Zeigler, M. (April, 2020). Implementation of A Food Insecurity Questionnaire for ERAS Colorectal Patients.. Poster presented at: Annual Resident & Fellow Research Forum; Royal Oak, MI, USA. Canceled Due To Covid-19

Reilly, D., DeMare, A., Kawak, S., ABDULLA, Y., Studzinski, D., Zeigler, M. (May, 2020). Implementation of A Food Insecurity Questionnaire for ERAS Colorectal Patients. Poster presented at: Michigan Chapter American College of Surgeons; Boyne Falls, MI, USA. Canceled Due To Covid-19.

Antonio Barbat

Tadros, R., Barbat, A., & Wilseck, J. (October, 2018). Contrast-Induced Nephropathy in CT Perfusion Imaging for Acute Ischemic Stroke. Poster presented at: Western Neuroradiological Society 50th Annual Meeting; Laguna Niguel, CA, USA.

Jessica Barnes

Barnes, J., Segars, L., Wasserman, J., Karabon, P., & Taylor, T. (October, 2020). Infectious Disease Management of Homeless and Non-Homeless Populations in United States Emergency Departments. Poster presented at: IDWeek 2020; Virtual.

Barnes, J., Segars, L., Wasserman, J., Karabon, P., & Taylor, T. (March, 2020). Infection Management of Homeless and Non-Homeless Populations in United States Emergency Departments. Oral Presentation presented at: Oakland University Graduate Student Research Conference; Rochester, MI, USA.

Barnes, J., Segars, L., Wasserman, J., Karabon, P., & Taylor, T. (June, 2019). Infection Treatment of Homeless and Non-Homeless Populations in United States Emergency Departments. 2019 Oakland University William Beaumont School of Medicine Embark Research Colloquium, M2 Oral Presentation Award Finalist; Royal Oak, MI, USA.

Evan Brickner

Brickner, E., Johnson, P., & Mathew, T. (October, 2020). Implementation and Evaluation of Alcohol Screening Tool in HIV Patients. Poster presented at: Infectious Disease Conference / IDWeek 2020 (virtual); Philadelphia, PA, USA

Meghan Brown

Brown M, Ober M. Centrifuge Concentrated Intravitreal Triamcinolone Acetonide: A Preliminary Study. Poster Presentation at the Midwest Graduate Research Symposium, Toledo, OH. April, 2020. [Accepted – Conference cancelled due to COVID-19]

Brown M, Ober M. Centrifuge Concentrated Intravitreal Triamcinolone. Poster Presentation at Oakland University Graduate Research Conference, Rochester, MI. March 15, 2019.

Elaina Clark

Clark E, Bastani A, Witczak C, Tausch K, Jones SC. "The Impact of Physical Therapy in the Emergency Department." Society of Academic Emergency Medicine Midwest Regional Conference; Southfield, MI. September 19, 2019.

Nardin Derias

Derias, N., Loftus, S., & Kamal-ElSayed, S. (April, 2020). Threshold Concepts in Preclinical Medical Education: Students' Perception Poster presented at: American Physiological Society at Experimental Biology (Cancelled due to COVID-19); San Diego, CA, USA.

Derias, N., Loftus, S., & Kamal-ElSayed, S. (May, 2020). Threshold Concepts in Preclinical Medical Education: Students' Perception Poster presented at: Medical Education Week at Oakland University (Virtual due to COVID-19); Rochester Hills, MI, USA.

Derias, N., Loftus, S., & Kamal-ElSayed, S. (June, 2020). Threshold Concepts in Preclinical Medical Education: Students' Perception Oral Presentation presented at: Michigan Physiological Society (Virtual due to COVID-19); Rochester Hills, MI, USA.

Derias, N., Loftus, S., & Kamal-ElSayed, S. Threshold Concepts in Medical Physiology. The FASEB Journal. 2020, Apr; 34(S1): 1-1. Pub Status: Published.

Tori Drzyzga

Why Don't Clinical Ethicists Document Treatment Preferences in Their Advance Directives? Drzyzga, V., Navin, M.C., Wasserman, J.A., Gibb, T.S. American Society for Bioethics and Humanities. Pittsburgh, PA, October 2019.

Wasserman JA, Navin MC, Drzyzga V, Gibb TS. Practising what we preach: clinical ethicists' professional perspectives and personal use of advance directives. Journal of Medical Ethics. Published Online First: 26 October 2020. doi: 10.1136/medethics-2020-106760

Justin Dzierzawski

Dzierzawski, J.T., Barremkala, M., Cortes, C. (2020, May). Assessment of a Video Game for Anatomy (Accepted, Conference converted to virtual due to COVID-19). 9th Annual William Davidson Medical Education Week at OUWB School of Medicine. Rochester, MI.

BreeOna Ebrecht

Namukowa B, Grogan J, Yoskowitz R. Medical students' responses to complex ethical challenges encountered during global medical experiences. 2019 Oakland University William Beaumont School of Medicine Embark Research Colloquium, M2 Oral Presentation Award Finalist; Royal Oak, MI, USA.

Heba Elassar

Heba Elassar, Zeynep Alpay-Savasan. "Racial Disparities in Perinatal Outcomes Among Patients with Pre-Gestational Diabetes Mellitus." Centennial Congress of the Medical Women's International Association (MWIA) hosted by the American Medical Women's Association, New York, NY. July 27, 2019.

Lara Fawaz

Fawaz, L & Afonso, N. (October, 2020). A Look into Medical Students' Knowledge on Adverse Childhood Experiences. Poster presented at: 2020 CHM Virtual Scholarly Activity Symposium; Online, MI, USA.

Fawaz, L & Afonso, N. A Look into Medical Students' Knowledge on Adverse Childhood Experiences. Poster presented at: 2021 IAMSE Annual Meeting; 2021 June 12-17. Online, Cancun, Mexico.

Class of 2021 Embark Program Scholarly Activity

Michelle Fedorowicz

Fedorowicz, M, Dennison, L, Papadimitriou PhD, C, & Swanberg, S.. (October, 2020). Understanding “Obamacare”- How Physicians View the Affordable Care Act: A Systematic Review. Poster presented at: The FMX Family Medicine Experience; Virtual, USA.

Savannah Fotheringham

Fotheringham, S., & Karabon, P., & Wunderlich-Barillas, T., & Traynor, J., & Gowans, K. Optimization of School Reintegration for Pediatric Oncology Patients and Their Peers. Continuity in Education. 2020, Jan; Pub Status: Accepted.

Patricia Fuentes

Porter E., Fuentes P., Siddiqui Z., Thompson A., Levitin R., Solis D., Myziuk N., and Guerrero T. Hippocampus segmentation on non-contrast CT using Deep Learning. Medical Physics. 2020, Feb; 47(7): 2950-2961. Cited in PubMed; PMID: 32065401. Pub Status: Published.

Sara Grant

Grant, S., Singh, A., & Roach, V.A.. (April, 2019). The effect of different auditory stimuli on laparoscopic skill acquisition. Poster presented at: Experimental Biology; Orlando, FL, USA.

Victoria Greenstein

Victoria Greenstein; Keith Engwall, MS. Bibliometric analysis of interdisciplinary collaboration in cancer immunotherapy research from 2010-2018. 2019 Oakland University William Beaumont School of Medicine Embark Research Colloquium, M2 Oral Presentation Award Finalist; Royal Oak, MI, USA.

Amanda Hirsch

Hirsch, Amanda. Carpenter, Christopher. (October, 2020). Missed opportunities for HIV screening in the emergency department Poster presented at: IDWeek 2020, Infectious Disease Society of America; Philadelphia, PA, USA.

Oluwatoyin Ibronke

Ibronke O, Scott Pickett, Daniel J. Gildner, Travis N. Ray, Michele R. Parkhill, & Amanda K. Burgess-Proctor. “Tonic Immobility and Post Traumatic Stress Symptom Severity in Relation to Potentially Traumatic Police Interactions”. Poster presented virtually at American Medical Student Association Conference.

Ibronke O, Scott Pickett, Daniel J. Gildner, Travis N. Ray, Michele R. Parkhill, & Amanda K. Burgess-Proctor. “Tonic Immobility and Post Traumatic Stress Symptom Severity in Relation to Potentially Traumatic Police Interactions”. Poster accepted for presentation at University of Toledo, 11th Annual Midwest Graduate Research Symposium.

Ibronke, O., Pickett, S., Gildner, D., Ray, T., Parkhill, M., Burgess, A. (October, 2020). Tonic Immobility and Post Traumatic Stress Symptom Severity in Relation to Potentially Traumatic Police Interactions Poster presented at: Poster presentation at American College of Physician Virtual Annual Scientific Meeting. Overall Award Winner- Quality Improvement IM 2021 winner.

Jieun Kang

Kang, J., Graetz, J.E., Grogan, J. (2020, March). Parameters influencing the diagnosis and start of treatment of autism spectrum disorder. Poster presented at the Oakland University Graduate Student Research Conference, Rochester, MI.

Alexis Kerl

Kerl, A., Parsons, T., Madlambayan, G. Revealing Tumor Microenvironment Response to Various Radiation Therapies. 2019 Oakland University William Beaumont School of Medicine Embark Research Colloquium, M2 Oral Presentation Award Finalist; Royal Oak, MI, USA.

David Lee

Lee, D., & Berger, D., & Wloszczynski, P., & Burla, M. (September, 2019). Assessing the impact of resuscitation residents on the treatment of cardiopulmonary resuscitation patients Oral Presentation presented at: Society for Academic Emergency Medicine Midwest Regional Meeting; Southfield, MI, USA

Lee, D. M., Berger, D. A., Wloszczynski, P. A., Karabon, P., Qu, L., & Burla, M. J. (2020). Assessing the impact of resuscitation residents on the treatment of cardiopulmonary resuscitation patients. The American Journal of Emergency Medicine.

Paul Lee

Cole D, Svider P, Shenouda K, Lee PB, Yoo N, McLeod T, Mutchnick S, Yoo G, Kaufman R, Callaghan M, Fribley A. Targeting the unfolded protein response in head and neck and oral cavity cancers. Experimental Cell Research, 2019; 382(1); 111385-111405.

Lee PB, Hojjat H. Unfolded Protein Response as a Therapeutic Target for Sinonasal Inverted Papilloma. Karmanos Cancer Center Head and Neck Research Meeting. Detroit, MI. November 19, 2018.

Lee PB, Hojjat H, Xi Y, Fribley AM, Folbe A. Unfolded Protein Response as a Therapeutic Target for Sinonasal Inverted Papilloma. Combined Otolaryngology Spring Meetings (COSM). Atlanta, GA. April 22, 2020 (cancelled due to COVID19 pandemic).

Lee PB, Hojjat H, Xi Y, Fribley AM, Folbe A. Unfolded Protein Response and Sinonasal Inverted Papilloma. 2020 American Rhinologic Society 66th Annual Meeting. Boston, MA. September 11-12, 2020 (cancelled due to COVID19 pandemic).

Kristin LeMarbe

LeMarbe K, Dalal B. (October, 2020). Is Compliance With Positive Airway Pressure Therapy Associated With Weight Change? Poster presented at: Michigan ACP Annual Fall Virtual Scientific Meeting (Virtual); Virtual, MI, USA. Awarded 3rd Place for Medical Student Research

Kelsey Leonard

Kelsey Leonard, BS; Dustin Baker, MD; Jacquelyn Pastewski, MD; Pavan Brahmamdam, MD; Kathryn Ziegler, MD; Victoria A. Roach, PhD. Correlating Laparoscopic Tool Path Length in Peg-Transfer Task with Surgical Residency Education Level. ACS (American College of Surgeons) Surgical Simulation Summit; March 14-16, 2019; Chicago, IL.

Kelsey Leonard, BS; Dustin Baker, MD; Jacquelyn Pastewski, MD; Pavan Brahmamdam, MD; Kathryn Ziegler, MD; Victoria A. Roach, PhD. Correlating Laparoscopic Tool Path Length in Peg-Transfer Task with Surgical Residency Education Level. Annual OUWB RJLSS (Robert J. Lucas Surgical Society) Research Symposium; March 5, 2019; Royal Oak, MI.

Jacquelyn Pastewski, MD; Dustin Baker, MD; Amy Somerset, MD; Kelsey Leonard, BS; Georges Azzie, MD; Victoria A. Roach, PhD; Kathryn Ziegler, MD; Pavan Brahmamdam, MD. Analysis of Instrument Motion and the Impact of Residency Level and Concurrent Distraction on Laparoscopic Skills. Journal of Surgical Education. July 30, 2020.

Class of 2021 Embark Program Scholarly Activity

Maria Lepore

Lepore, M., Sayed, L., Mahjoub, Z., Anderson, W., Bastani, A. & Kanluen, T. (March, 2020). EkoSonic Endovascular System: A Targeted Therapy for Submassive Pulmonary Embolism. Poster presented at: Oakland University Graduate Student Research Conference; Rochester, MI, USA.

Lepore, M., Sayed, L., Mahjoub, Z., Anderson, W., Bastani, A. & Kanluen, T. (September, 2019). From Academia to Community Hospital ED: Ultrasound-Assisted Catheter-Directed Thrombolysis for Submassive Pulmonary Embolism is Feasible and Improves Mortality. Oral Presentation presented at: Society for Academic Emergency Medicine Midwest Regional Meeting; Southfield, MI, USA.

Lepore, M., Sayed, L., Mahjoub, Z., Anderson, W., Bastani, A. & Kanluen, T. (April, 2020). A Targeted Therapy for Submassive Pulmonary Embolism: EkoSonic® Endovascular System. Poster accepted at: 11th Midwest Graduate Research Symposium - Canceled due to COVID-19; Toledo, OH, USA.

Daniela Lozano

Lozano D., Porter E., Guerrero T.M. Deriving pulmonary perfusion images from 4DCT using deep learning. Oral presentation at: the IASLC 2020 World Conference on Lung Cancer; Jan, 2021; Singapore, Worldwide Virtual Event.

Nikhil Mankuzhy

Mankuzhy NP, Almahariq M, Ye H, Amin M, Krauss DJ. Prognostic Significance of Neuroendocrine Differentiation in Prostate Adenocarcinoma in Patients with Metastatic Disease. Poster presentation at 2019 ASCO Annual Meeting, Medical Student & Resident Abstract Forum, June 2019.

Mankuzhy NP, Almahariq MF, Ye H, Amin M, Stone B, Krauss DJ. Investigation of the Prognostic Significance of Neuroendocrine Differentiation in Gleason Score 7-10 Prostate Adenocarcinoma in Patients With Distant Metastasis after Definitive Radiotherapy. *Am J Clin Pathol*. Online ahead of print.

Michael Maywood

Michael J. Maywood, Muayad F. Almahariq, Ronald B. Levitin, Bryan S. Squires, Maha S. Jawad, Peter Y. Chen, Gregory S. Gustafson, Joshua T. Dilworth. Mapping of Metastatic Level I Axillary Lymph Nodes in Patients with Newly Diagnosed Breast Cancer. Presented at: The Oakland University Graduate Student Research Conference 2020; March 6, 2020; Rochester, MI

Almahariq MF, Maywood MJ, Levitin RB, et al. Mapping of Metastatic Level I Axillary Lymph Nodes in Patients with Newly Diagnosed Breast Cancer. *International Journal of Radiation Oncology*Biophysics*Physics*. January 2020.

Megan McCrohan

McCrohan, M., & Dereski, M. (June, 2019). Continuing Medical Education for Primary Care Providers Treating Young Adults with Autism Poster presented at: International Association of Medical Science Educators (IAMSE) Annual Meeting; Roanoke, VA, USA.

McCrohan, M., & Dereski, M. (May, 2019). Continuing Medical Education for Primary Care Providers Treating Young Adults with Autism Poster presented at: William Beaumont Center for Medical Education Week; Royal Oak, MI, USA.

Marcel Mic

Efficacy of directed-independent learning module on the complement system. Marcel Mic, Ayoda Werede, Sofia Kosmidis, Tudor Moldovan, Claudio Cortes, D.V.M., Ph.D, Poster presentation at Medical Education Week OUWB - May 2019

Efficacy of directed-independent learning module on the complement system. Marcel Mic, Ayoda Werede, Sofia Kosmidis, Tudor Moldovan, Claudio Cortes, D.V.M., Ph.D, Poster presentation at Medical Education Week OUWB - May 2020

Madison Mohr

Mohr M, Olive EJ, Barremkala M, Venuti JM. (April, 2019). The Etymological Dissection Approach for Learning Embryology Terminology Poster presented at: America Association of Anatomy at the annual Experimental Biology Conference; Orlando, FL, USA.

Mohr MM, Olive EJ, Barremkala M, Browne B, Venuti JM. (April, 2020). Does Teaching an Etymological Dissection Tool Aid Student Understanding and Retention of Terminology? Poster presented at: America Association of Anatomy at the annual Experimental Biology Conference - Online; San Diego, CA, USA.

Mohr MM, Olive EJ, Barremkala M, Browne B, Venuti JM. (May, 2020). Determining the Effectiveness of an Etymological Learning Tool Poster presented at: Oakland University William Beaumont's 8th Annual William Davidson Medical Education Week - Online; Rochester, MI, USA.

Mohr MM, Olive EJ, Barremkala M, Browne B, Venuti JM. (August, 2019). Etymological Dissection Approach (EDA) for Learning Embryological Terminology. In-Person Workshop presented with Academic Success Team at Oakland University William Beaumont School of Medicine. Rochester, MI, USA.

Madalyn Nygren

The Incidence and Downstream Effect of Guideline Non-adherence: The HEART Score in the Community Hospital ED Setting. Nygren, Madalyn; Alafyouni M.D., Maisa; Abbott, Ryan; Jones M.D., FACEP, Shanna; Anderson M.D., William; Bastani M.D., FACEP, Aveh; Jaroszewski M.D., Kristie. American College of Emergency Physicians 2019 Conference - Invited Oral Presentation as an Oakland University William Beaumont School of Medicine Class of 2021 Candidate. Denver, CO, October 2019.

Nygren M; Alafyouni M; Abbott R; Jones S; Anderson W; Bastani A; Jaroszewski K. The Incidence and Downstream Effect of Guideline Non-adherence: The HEART Score in the Community Hospital ED Setting. *Annals of Emergency Medicine*, 2019, October; 74(4); S25.

Allison Palmer

Palmer, Allison, Lucia, Victoria. (October, 2019). The Perception of the Physician-Patient Relationship among Behavioral Health Patients in the Context of Race/Ethnicity Poster presented at: Student National Medical Association (SNMA) Region V Medical Education Conference (RMEC); Toledo, OH, USA.

Palmer, Allison, Lucia, Victoria. (March, 2020). The Perception of the Physician-Patient Relationship among Behavioral Health Patients in the Context of Race/Ethnicity Poster presented at: Oakland University (OU) Graduate Student Research Conference (GSRG); Rochester Hills, MI, USA.

Class of 2021 Embark Program Scholarly Activity

Palmer, Allison, Lucia, Victoria. (April, 2020). The Perception of the Physician-Patient Relationship among Behavioral Health Patients in the Context of Race/Ethnicity Poster presented at: Student National Medical Association (SNMA) American Medical Education Conference (AMEC); Cleveland (virtual), OH, USA.

Girish Pathangey

Pathangey, G., Hanzel, G.S., Shannon, F., Hanson, I., Lau, W., Almany, S., Safian, R.D., Kerner, N., Gallagher, M., Vivacqua, A., Abbas, A.E. Left Ventricular Diastolic Function Improvement One Year After Transcatheter Aortic Valve Replacement for Severe Aortic Stenosis. *Journal of the American College of Cardiology*. 2020, Mar; 75(11): 1256.

Alyssa Perozich

Zeman LL, Wilson S, Reznar M, Ashkar A, Perozich A, and Goeting R. (October, 2019). Completing a Survey Can Induce Healthy Behavior Changes: Implications for Prevention and Population Health. Poster presented at: Collaborative Family Healthcare Association 21st Annual Conference; Denver, CO, USA.

Zeman LL, Wilson S, Reznar M, Ashkar A, Perozich A, and Goeting R. Completing a Survey Can Induce Healthy Behavior Changes: Implications for Prevention and Population Health. Poster presented at the 2nd Annual Michigan Health Psychology Symposium. Howell, MI. Nov 1, 2019.

Mallory Peters

Peters, M., & Derias, N., & Saban, R., & Patino, G. (April, 2020). Predictors of Sensorineural Hearing loss in Pediatric Bacterial Meningitis: A Systematic Review Poster presented at: Combined Otolaryngology Spring Meetings, American Society of Pediatric Otolaryngologists (virtual); Atlanta, GA, USA.

Nahrain Putris

Putris N., Dailey W., Metcalf B., Mitton K.P. "Differential Activation of p38-MAPK by VEGFA-165b and VEGFA-165a Results in Different Migration Activity of Primary Human Retinal Endothelial Cells." *ARVO*. 2020. *Invest. Ophthalmol. Vis. Sci.* 2020; 61(7):4445.

Raza Qadir

Qadir, R., Sculthorpe, N.F., Todd, T., & Brown, E.C.. (May, 2020). Resistance Exercise And Cardiometabolic Risk In Prediabetes: A Systematic Review And Meta-analysis Poster presented at: 2020 Annual Meeting, World Congress on Exercise is Medicine®, and World Congress on the Basic Science of Exercise in Regenerative Medicine of the American College of Sports Medicine. (Virtual due to COVID-19); San Francisco, CA, USA.

Andrew Ragheb

Ragheb, A., Vanood, A., Fahim, D.K.. (March, 2020). Radiofrequency Ablation and Kyphoplasty for Treatment of Metastatic Breast Cancer Spinal Fractures Poster presented at: Robert J. Lucas Surgical Society Research Symposium; Royal Oak, MI, USA. *First place Poster Presentation

Ragheb, A., Vanood, A., Fahim, D.K.. (March, 2020). Radiofrequency Ablation and Kyphoplasty for Treatment of Metastatic Breast Cancer Spinal Fractures Poster presented at: Oakland University Graduate Student Research Symposium; Rochester, MI, USA. *First place Poster Presentation

Ragheb, A., Vanood, A., Fahim, D.K.. The Addition of Radiofrequency Tumor Ablation to Kyphoplasty Reduces the Rate of Local Recurrence in Spinal Fractures Secondary to Metastatic Breast Cancer. *Neurosurgery*. 2021, Jan; Pub Status: Submitted.

Alexandra Ranski

Ranski AH, Moysidis SN, Mahmoud TH. (May, 2018). Intravitreal Thrombolytics as a Novel Treatment Option for Central Retinal Vein Occlusions. 2019 Oakland University William Beaumont School of Medicine Embark Research Colloquium, M2 Oral Presentation Award Finalist; Royal Oak, MI, USA.

Ranski A.H., & Moysidis S., & Mahmoud T.H.. (May, 2020). Factors affecting prognosis of patients with Central Retinal Vein Occlusion treated with intravitreal anti-VEGF or corticosteroids Poster presented at: The Association for Research in Vision and Ophthalmology; Baltimore, MD, USA.

Mitchell Reitsma

Greenstein V, Reitsma M, Diklich N, Patino G. (May, 2020). Should I Stay or Should I Go: Applying Self-Determination Theory to Examine OUWB Students' Motivations for Attending Lectures Poster presented at: William Davidson Medical Education Week; Rochester, MI, USA.

Reitsma M, Greenstein V, Diklich N, Patino G.. (May, 2020). Starving for Time: An Analysis of OUWB Student Preferences on the 2-Hour Lunch Break Poster presented at: William Davidson Medical Education Week; Rochester, MI, USA.

Danielle Reynolds

Reynolds, D., Vanood, A., & Gould, D. (April, 2020). 5-HTTLPR Modulation of Amygdalar Functional Connectivity and Emotional Regulation: A Systematic Review. Poster presented at: American Academy of Neurology Annual Meeting; Toronto, ON, CAN

Kristin Rybski

Rybski, K.J., & Sundram, U.N. (November, 2020). Comparing Breast Cancer Biomarkers Between Initial Core Needle Biopsy/Lumpectomy Specimens and Subsequent Cutaneous Metastases. Poster presented at: The 57th Annual Meeting of The American Society of Dermatopathology; Chicago, IL, USA.

Zachary Scherzer

Preferences and perceptions of Patient and Family-Centered Care (PFCC). Oakland University Graduate Research Seminar. Rochester, MI, March 20, 2019

Preferences and perceptions of Patient and Family-Centered Care (PFCC). Patient and Family-Centered Care (PFCC) Leadership Conference: Beaumont Health System. Novi, MI, November 13, 2018

Daniel Schoenherr

Schoenherr, D.T., Dereski, M.O., Bernacki, K.D., Hafez-Khayyata, S., & Attardi, S.M. Online integrative histology module improves self-efficacy for medical students with lower course performance. *The Federation of American Societies for Experimental Biology Journal*. 2020, Apr; 34(S1): 1.

Schoenherr, D.T., Dereski, M.O., Bernacki, K.D., Hafez-Khayyata, S., & Attardi, S.M. (May, 2020). Integrative online histology module improves pathology self-efficacy for medical students with lower course assessment scores. Poster presented at: William Davidson Medical Education Week (cancelled due to COVID-19 pandemic); Royal Oak, MI, USA.

Class of 2021 Embark Program Scholarly Activity

Schoenherr, D.T., Dereski, M.O., Bernacki, K.D., Hafez-Khayyata, S., & Attardi, S.M. (March, 2019). Online integrative histology module improves medical students' self-efficacy but not performance in respiratory histopathology. Poster presented at: AAMC Central Group on Educational Affairs Spring Meeting; Grand Rapids, MI, USA.

Schoenherr, D.T., Dereski, M.O., Bernacki, K.D., Hafez-Khayyata, S., & Attardi, S.M.. (April, 2020). Online integrative histology module improves self-efficacy for medical students with lower course performance. Oral Presentation presented at: American Association for Anatomy meeting at Experimental Biology (cancelled due to COVID-19 pandemic); San Diego, CA, USA.

Aryana Sharrak

Sharrak A., Yoskowitz R., Karabon P., & Lerchenfeldt S. "Understanding Opioid Addiction in the Chaldean Community." 2019 Oakland University William Beaumont School of Medicine Embark Research Colloquium, M2 Oral Presentation Award Finalist; Royal Oak, MI, USA.

Sharrak A., Yoskowitz R., Karabon P., & Lerchenfeldt S. "Understanding Opioid Addiction in the Chaldean Community." Poster presentation at the MI American College of Physicians Annual Fall Scientific Meeting, Grand Rapids, MI in October, 2019.

Sharrak A., Yoskowitz R., Karabon P., & Lerchenfeldt S. Understanding Opioid Addiction in the Chaldean Community. Pub Status: Accepted for publication in Journal of Immigrant and Minority Health.

Bhavneet Singh

Singh B, Hajj Hussein I. (June, 2019). Comparing Clinical Outcomes Between Conventional vs. Mako Robotic-Assisted Unicompartamental Knee Arthroplasties. 2019 Oakland University William Beaumont School of Medicine Embark Research Colloquium, M2 Oral Presentation Award Finalist; Royal Oak, MI, USA.

Haley Smallwood

Smallwood H, Wasserman JA. Understanding the perceptions of case managers on needed resources when working with homeless patients. Collaborative Case Management. 2021 Jan; 77: 15-19.

Aviv Spillinger

Spillinger A, Low C, Smith B, Stokken J, O'Brien E, Choby G. Presentation and outcomes of chronic rhinosinusitis following liver and kidney transplant. 2019 Oakland University William Beaumont School of Medicine Embark Research Colloquium, M2 Oral Presentation Award Finalist; Royal Oak, MI, USA.

Jonathan Tang

Tang, J., & Bicos, J.. (March, 2020). Meniscal Repair Trends at William Beaumont Hospital – A Longitudinal Review. Poster presented at: Fifth Annual Oakland University Graduate Student Research Conference; Rochester, MI, USA.

Courtney Todd

Todd, C. L. & Dereski, M. O. Identifying Healthcare Provider Accommodations for Adult Patients with Autism Spectrum Disorder. 03/2019. Poster Presentation, Oakland University Graduate Student Research Conference, Rochester, MI.

Todd, C. L. & Dereski, M. O. Identifying Healthcare Provider Accommodations for Adult Patients with Autism Spectrum Disorder. 06/2019. Poster Presentation, International Association of Medical Science Educators, Roanoke, VA.

Kristopher Torossian

Torossian, K.A., Ford, E., Altwail, M., Paternoster, R., & Swor, R.A.. (August, 2018). Understanding Witness Actions in Response to Out of Hospital Cardiac Arrests Poster presented at: Oakland University William Beaumont School of Medicine Summer Internship Poster Session; Rochester, MI, USA.

Torossian, K.A., Ford, E., Altwail, M., Paternoster, R., & Swor, R.A.. (November, 2020). Understanding Witness Actions in Response to Out of Hospital Cardiac Arrests Poster presented at: American Heart Association Resuscitation Science Symposium 2020; Dallas, TX, USA.

Torossian, K.A., Ford, E., Altwail, M., Paternoster, R., & Swor, R.A.. (September, 2019). Understanding Witness Actions in Response to Out of Hospital Cardiac Arrests Oral Presentation presented at: Society for Academic Emergency Medicine Midwest Regional Meeting; Southfield, MI, USA.

Ross Touriel

Touriel R, Dunne R, Swor R, Kowalenko T. A Pilot Study: Emergency Medical Service Related Violence in the Out-of-Hospital Setting in Southeast Michigan. Abstract number 151. [Abstract from Carhart E. Abstracts for the 2020 NAEMSP Scientific Assembly. Prehosp Emerg Care. 2019;24(1):100-156. Published 2019 Oct 17.] PMID: 31525111.

Touriel R, Dunne R, Swor R, Kowalenko T. A Pilot Study: Emergency Medical Service Related Violence in the Out of Hospital Setting in Southeast Michigan. Poster presented at NAEMSP 2020 (National Association of EMS Physicians 2020 Annual Meeting: Specialty Workshops, Scientific Assembly and Trade Show) in San Diego, CA, Jan 6-11, 2020.

Touriel R, Dunne R, Swor R, Kowalenko T. A Pilot Study: Emergency Medical Service Related Violence in the Out of Hospital Setting in Southeast Michigan. 2019 Oakland University William Beaumont School of Medicine Embark Research Colloquium, M2 Oral Presentation Award Finalist; Royal Oak, MI, USA.

Touriel R, Dunne R, Swor R, Kowalenko T. A Pilot Study: Emergency Medical Services-Related Violence in the Out-of-Hospital Setting in Southeast Michigan. J. Emerg. Med. In press.

Aimen Vanood

Vanood A, Ragheb A, Fahim DK. (April 2020). Efficacy of Posterior Vertebroctomy with Short Segment Instrumentation in Treatment of Thoracic Spinal Metastasis. Accepted to: American Association of Neurological Surgeons Annual Scientific Meeting; (Virtual)

Vanood A, Ragheb A, Fahim DK. Efficacy of Transpedicular Vertebroctomy with Short Segment Instrumentation for the Treatment of Thoracic Spinal Metastasis (Abstract). Neurosurgery. 2020;67(Supplement 1).