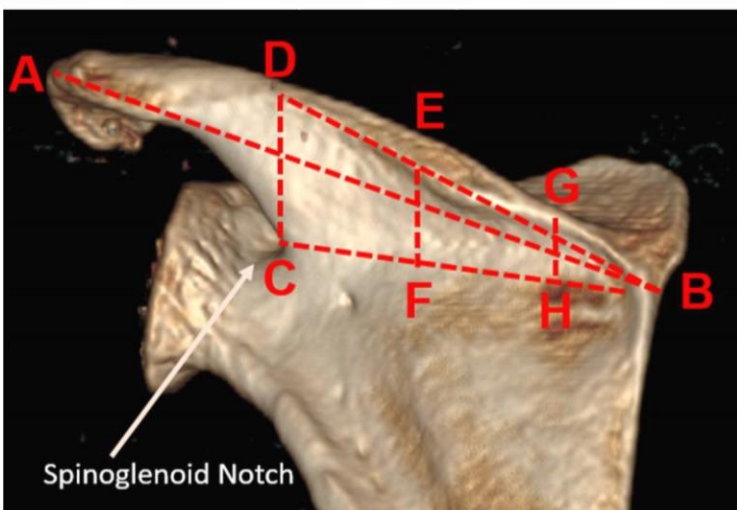
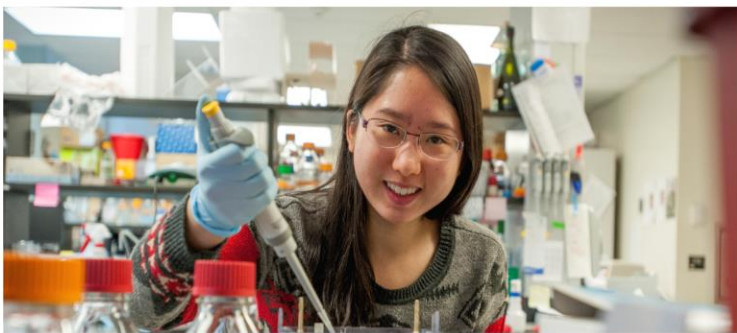
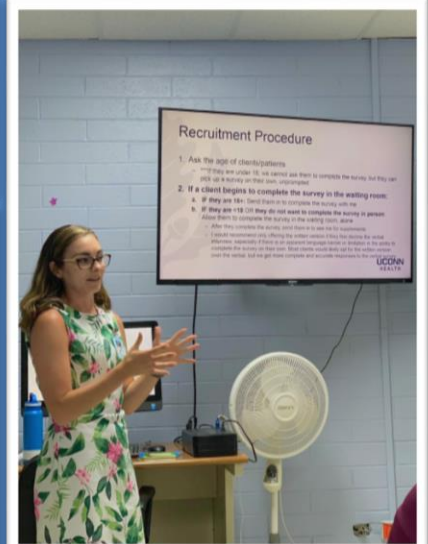
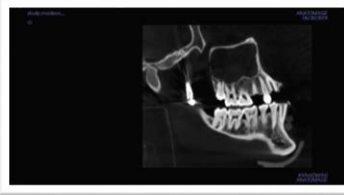
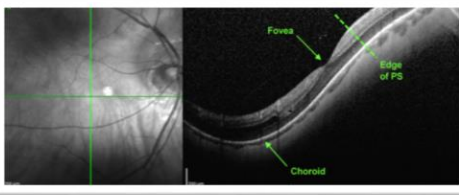


Medical & Dental Student Research Day 2020



Schedule of Events

March 2, 2020

Student & Mentor Breakfast:

7:15am | Academic Rotunda

Keynote Address:

8:00am | Academic Rotunda

Class of 2020 Capstone Presentations:

9:00-12:00pm | Academic Rotunda / Breakout Classrooms

Oral Presentations:

12:00-1:30pm | Academic Rotunda

Poster Sessions:

1:30-4:00pm | Academic Rotunda & Lobby / Breakout Classrooms



Jerome M. Adams

KEYNOTE ADDRESS

“Advancing the Health of the Nation”

Jerome M. Adams MD, MPH

Surgeon General of The United States

Jerome M. Adams is the 20th Surgeon General of The United States. His mission as the “Nation’s Doctor,” is to advance the health of the American people. Dr. Adams’ motto as Surgeon General is “better health through better partnerships.” He is committed to strengthening relationships with all members of the health community, and forging new partnerships with members from the business, faith, education and public safety and national security communities. Dr. Adams has pledged to lead with science, and facilitate locally led solutions to the nation’s most difficult health problems.

Capstone Presentations

Digital Presentations (15 min)

9:00 – 12:00pm Multiple rooms around the Academic Rotunda

9:30 am - A7: **Detrimental Effects of Sleep Disordered Breathing on Left Ventricular and Left Atrial Function Evaluated by Echocardiography**

Santiago Alday, Dr. Kai Chen

9:15 am - A2: **Associations Between Parental Food Literacy and the Weight Status of Their Child**

Elizabeth Atteh, Dr. Anton Alerte

9:00 am - A5: **The Development of Instructional Musculoskeletal Physical Exam Resources Targeted Towards Medical Students**

Nicholas Barressi, Dr. Adam Perrin

9:15 am - A4: **Role of Systemic Genital Tract Cytokines and Immune Cell Activity in Spontaneous Preterm Birth**

Anastasia Barros, Dr. Christopher Nold

11:45 am - A6: **Assessing Fourth Year Medical Student Skills After A Transition to Residency Course: A Pilot Study**

Patrick Bergamo, Dr. Alise Frallicciardi, Dr. Matthew Babcock, Dr. Mariann Nocera

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10:45 am - A6: **A 'Primary Care Office of the Future' Innovation Workshop Changes Medical Student Attitudes Toward Primary Care and Innovation**

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Alexander Giuliano, Dr. Pooja Luthra

10:15 am - A6: **Incorporating Integrative Medicine into the UConn MDelta Curriculum**

Agata Harabasz, Dr. Mary Guerrero, Dr. Zita Lazzarini

11:15 am - A8: **Is PTSD the Best Diagnosis for Children and Adolescents?**

Nia Harris, Dr. Rocio Chang, Dr. Julian Ford

10:45 am - A4: **The Role of MicroRNA-150 on the Regulation of CD4 T Cells.**

Rafique Haynes, Dr. Anthony Vella

10:00 am - A1: **Outcomes in Abdominal Wall Reconstruction at a Single Institution**

Emily Isch, Dr. Ashley Althoff

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Craig Macken, Dr. Augustus Mazzocca

11:30 am - A5: **Fundamentals of Laparoscopic Skills Elective for 4th-Year Medical Students**

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Jorge Ortiz-Colon, Dr. Kristyn Zajac

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Christine Parsons, Dr. Kevin Dieckhaus

9:00 am - A5: **The Development of Instructional Musculoskeletal Physical Exam Resources Targeted Toward Medical Students**

Colin Pavano, Dr. Adam Perrin

9:30 am - A1: **Evaluation of Echocardiography Screening and Surveillance Guidelines in Patients Who Have Received Anthracyclines or Trastuzumab Chemotherapy.**

Brendan Pier, Dr. Agnes Kim

9:45 am - A2: **Quality of Care in Medical Student-Run Free Health Clinics: An Evaluation of Quality Measures of Free and Charitable Health Clinics and Their Application at UConn School of Medicine Student-Run Free Health Clinics and Migrant Farm Workers Clinic**

Angela Quental, Dr. Bruce Gould

9:15 am - A8: **Factors Affecting Hospital Stay of Acute Pancreatitis Patients**

Willeed Rabah, Dr. David McFadden

9:15 am - A6: **Examining the Role of Adverse Childhood Experiences on the Development of Chronic Illness: A Literature Review and Educational Tool**

Sarah Reid, Dr. Rocio Chang

9:00 am - A7: **Healthcare Expense Following Sleeve Gastrectomy vs. Roux-en-Y Gastric Bypass**

Kyle Robey, Dr. James Grady

11:00 am - A5: **Evaluation of the University of Connecticut School of Medicine Clerkship Readiness: Comparing the MDelta and Legacy Curriculum**

Darnell Robin, Dr. Christine Thatcher

10:15 am - A8: **Tracking Chronic Opioid Prescribing Metrics for Quality Improvement – What Happens to Patients who Fall off the List?**

Sonali Rodrigues, Dr. Marilyn Katz

9:30 am - A3: **Barriers to Healthcare Access for Families with Children with Chronic Illness and Disability in the Setting of Political Crisis in Nicaragua**

Brooke Schuman, Dr. Kevin Dieckhaus, Michael Cipoletti, Dr. Sean McKenna, Dr. Timothy Rugile

10:00 am - A3: **The Effect of Early Cross Cultural Immersion Experiences on Intercultural Sensitivity, Empathy and Leadership within the Health Field**

Brandon Shore, Dr. Kevin Dieckhaus

11:30 am - A3: **Actionability of A Newly Developed Online Nutrition Education Tool: “Small Changes in Diet, Big Changes in Health”**

Martina Sinopoli, Dr. Pooja Luthra

10:30 am - A5: **Impact of Just-In-Time Emergency Department Simulation Training on Medical Student Procedural Performance**

Samuel Southgate, Dr. Alise Frallicciardi

10:15 am - A2: **Pediatric Environmental Exposures in Connecticut Public Schools: A Case for Prevention**

Kathryn Topalis, Dr. Eileen Storey

11:15 am - A6: **Regional Distributions and Temporal Changes of the Prevalence of Students with Autism Spectrum Disorder in Connecticut School Systems K-12**

Lanya Tseng, Dr. Roger Thrall

11:00 am - A3: **Qualitative Assessment of Reasons for Living in Older Incarcerated Persons in Connecticut Prisons**

Rafael Vissepo, Dr. Lisa Barry

9:45 am - A8: **Implementation of the Measurement of Gait Speed into the Electronic Health Record System**

Stephanie Vu, Dr. Lisa Barry, Dr. George Kuchel

10:45 am - A8: **Employing Risk Stratification to Decrease CT Pulmonary Angiogram Usage for Pulmonary Embolism Diagnosis**

Kristina Wagner, Dr. Matthew Ledford

11:00 am - A1: **The Effects of Low-dose Aspirin on the Placental Pathology in Women with Preeclampsia**

Yanbin Wang, Dr. Chris Morosky

10:15 am - A6: **Incorporating Integrative Medicine into the UConn MDelta Curriculum**

Christina Yang, Dr. Mary Guerrero, Dr. Zita Lazarini

A4
Laboratory

A5
Education

A3
Public
Health

A6
Education

A2
Public
Health

A7
Clinical

A1
Clinical

A8
Clinical

Academic
Rotunda

Capstone Presentations

Room A1

Topic Area: Clinical

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Samuel Crooks, Dr. Agnes Kim

9:30 am - A1: **Evaluation of Echocardiography Screening and Surveillance Guidelines in Patients Who Have Received Anthracyclines or Trastuzumab Chemotherapy.**

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Capstone Presentations

Room A2

Topic Area: Public Health

9:15 am - A2: **Associations Between Parental Food Literacy and the Weight Status of Their Child**

Elizabeth Atteh, Dr. Anton Alerte

9:45 am - A2: **Quality of Care in Medical Student-Run Free Health Clinics: An Evaluation of Quality Measures of Free and Charitable Health Clinics and Their Application at UConn School of Medicine Student-Run Free Health Clinics and Migrant Farm Workers Clinic**

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Capstone Presentations

Room A4

Topic Area: Laboratory

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Anastasia Barros, Dr. Christopher Nold

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Craig Macken, Dr. Augustus Mazzocca

Capstone Presentations

Room A5

Topic Area: Education

9:00 am - A5: **The Development of Instructional Musculoskeletal Physical Exam Resources Targeted Towards Medical Students**

Nicholas Barressi, Dylan Buller, Colin Pavano, Dr. Adam Perrin

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Capstone Presentations

Room A6

Topic Area: Education

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Sarah Reid, Dr. Rocio Chang

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Capstone Presentations

Room A7

Topic Area: Clinical

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Kyle Robey, Dr. James Grady

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Santiago Alday, Dr. Kai Chen

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Capstone Presentations

Room A8

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11:15 am - A8: **Is PTSD the Best Diagnosis for Children and Adolescents?**

Nia Harris, Dr. Rocio Chang

Detrimental Effects of Sleep Disordered Breathing on Left Ventricular and Left Atrial Function Evaluated by Echocardiography

Santiago Alday², Osama Mukarram¹, Andre Gabriel¹, Kai Chen^{1,2}

¹*Department of Medicine, University of Connecticut Health Center, Farmington, CT*

²*University of Connecticut School of Medicine, UConn Health, Farmington, CT*

Background: Sleep disordered breathing (SDB) increases the risk of both systolic and diastolic heart failure [1]. Early detection of subclinical cardiac dysfunction by echocardiography in these patients can help understand the underlying pathophysiology and guide intervention during early disease process.

Methods: 282 subjects undergoing polysomnography and echocardiogram from January 2015 through December 2017 at The University of Connecticut were enrolled. Patients with left ventricular ejection fraction <50% were excluded. Subjects were divided based on their Apnea Hypoxia Index (AHI) into a Control group (AHI <5, n=71), Mild group (AHI 5-15, n=97), and Moderate to Severe group (AHI >15, n=114).

Results: Demographic characteristics including age, sex, prevalence of hypertension and diabetes were comparable among the three groups, with the exception of higher BMI in the Mod/Sev group. Both Mild and Mod/Sev groups exhibited significantly reduced mitral annular relaxation velocity e' (7.6 cm/s and 7.1 cm/s in septal, 9.4cm/s and 8.7 cm/s in the lateral, respectively) compared to the Control group (8.2 cm/s septal, $p < 0.01$; and 9.9 cm/s lateral, $p < 0.005$), suggesting impaired diastolic function even in the mild group. While LVEF was not different, LV global longitudinal strain showed significant decline from -19.9% in the Control to -17.8% and -17.0% in Mild and Mod/Sev groups, respectively, $p < 0.05$. Left atrial mean strain (LAMS) followed a similar pattern with 35% in the Control, 30.9% in the Mild, and 28.7% in the Mod/Sev group ($p < 0.05$). In contrast, LA volume remained unchanged.

Conclusion: Sleep disordered breathing, even in mild severity, is strongly associated with cardiac dysfunction as evident by left ventricular diastolic dysfunction and left atrial deformation change, preceding the impairment of LV systolic function and LA remodeling.

References:

1. Yang S. Q., Han L. L., Dong X. L., et al. Mal-effects of obstructive sleep apnea on the heart. *Sleep and Breathing*. 2012;16(3):717–722.

Associations Between Parental Food Literacy and the Weight Status of Their Child

Elizabeth O. Atteh¹, Deepa Limaye², Anton Alerte²

¹*University of Connecticut School of Medicine, UConn Health, Farmington, CT*

²*University of Connecticut School of Medicine, Department of Pediatrics, Farmington, CT*

Background: Food Literacy (FL) is a relatively new term that encompasses the acquisition of important knowledge and skills, as well as abilities and choices related to food and nutrition [1]. The term goes beyond having knowledge about what kinds of food are healthy and nutritious but includes having skills related to planning, selecting, preparing and eating meals/food [2]. Although there is literature that characterizes factors such as lower SES, race that are associated with deficits in nutrition knowledge in parents of obese children, not much is known about associations between level of FL in parents and weight status of their children [3].

Hypothesis: Parental FL, as assessed by a self-administered survey, is negatively correlated with an increased rate of overweight and obese status in their children.

Methods: A 31 question self-administered survey was completed by parents of pediatric patients ages 2-17 at a private pediatric practice in Connecticut during the months of October and November 2019. The questions were adapted from a validated FL questionnaire used in Australia and included demographic questions as well as behavioral questions related to planning and management, selection and preparation of healthy foods. Height and weight for 87 children were recorded and used to calculate Body Mass Index (BMI) and BMI percentile. Pearson Correlations used to compare composite parental FL scores and child BMI percentile. One-way analysis of variance (ANOVA) was performed to assess differences in FL between demographic groups. Significance level will be determined by: $\alpha < 0.05$.

Results: In this initial analysis, the sample size consisted of 61 parents and 89 children. Of the 87 pediatric patients analyzed 10% were overweight and 21% were obese. There was no significant differences in FL between groups based on race, education level or household income. No significant relationship was found between parental food literacy and child BMI percentile ($\alpha=0.56$). However, both higher levels of vegetable intake ($\alpha = 0.003$) and fruit intake ($\alpha = 0.006$) were associated with higher parental food literacy levels. Increased parental income was negatively correlated with child BMI percentile ($\alpha = 0.042$) and increased frequency of running out of money for food was positively correlated with child BMI category ($\alpha = 0.004$).

Conclusion: In this preliminary analysis, parental food literacy is not correlated with weight status of their child. The study is a work in progress and a larger sample size may yield more significant results that may in turn help inform future childhood obesity interventions.

References:

1. Truman E., Lane D., Elliott C. Defining food literacy: A scoping review. *Appetite*. 2017;116:365–371.
2. Vidgen H.A., Gallegos D. Defining food literacy and its components. *Appetite*. 2014;76:50–59. doi: 10.1016/j.appet.2014.01.010.
3. Cluss PA, Ewing L, King WC, Reis EC, Dodd JL, Penner B. Nutrition knowledge of low-income parents of obese children. *Transl Behav Med*. 2013;3(2):218–225.

The Development of Instructional Musculoskeletal Physical Exam Resources Targeted Towards Medical Students

Dylan Buller¹, Colin Pavano¹, Nicholas Barresi¹, Adam Perrin²

¹*University of Connecticut School of Medicine, UConn Health, Farmington, CT*

²*Department of Family Medicine, UConn Health, Farmington, CT*

Background/Objectives: Clinical instruction in the musculoskeletal (MSK) physical exam (PE) is critical for nearly all medical practitioners. During the course of pre-clinical education in the MSK PE at the University of Connecticut's Delivery of Clinical Care (DoCC) course, a dearth of up-to-date, high-quality resources was identified. A quality improvement initiative was thereby commenced in an attempt to create improved MSK PE resources for DoCC and to assess the impact that these new resources had on student satisfaction of resources and mastery of the MSK PE.

Methods: Three MSK areas of focus were identified for this project: the shoulder, the knee, and the low back. PowerPoint and video resources were produced in conjunction with faculty in the Department of Orthopedics. These resources included methodology and demonstration of proper PE techniques, as well as educational material regarding anatomy and common pathologies, using an established textbook for reference.¹ Student feedback of DoCC MSK resources, student performance on clinical skills examinations, and student performance on written MSK questions were analyzed, stratified by students utilizing the original MSK resources compared with students utilizing updated MSK resources.

Results: Video and PowerPoint resources for MSK PE were developed and introduced to the DoCC pre-clinical course after the 2016/17 course. Evaluations completed by 100 pre-intervention and 131 post-intervention students were analyzed. Student satisfaction regarding MSK PE resources significantly improved after implementation of updated materials (mean percent increase in Likert rating, pre- to post-intervention: 20.6%; 95% CI 15.6%–25.8%, $p<.0001$). Student perception of preparatory workload manageability also significantly improved after implementation of updated materials (mean percent increase in Likert rating, pre- to post-intervention: 23.6%; 95% CI 18.4%–29.0%, $p<.0001$). Performance on written examination questions improved between students using old versus updated resources (2016/17: 63.5% vs. 2017/18: 87.6% vs. 2018/19: 88.5%).

Conclusions: Student satisfaction is improved by utilizing streamlined, tailored resources for MSK PE. Success was achieved with implementation of MSK PE resources, and the development of additional resources has been completed. These have been delivered to DoCC leadership along with a summary of statistical findings. Statistical analysis will be undertaken to confirm student preference of these additional updated resources.

References:

1. Bickley, Lynn S., et al. *Bates' Guide to Physical Examination and History-Taking*. Wolters Kluwer Health/Lippincott Williams & Wilkins, 2013.

Role of Systemic Genital Tract Cytokines and Immune Cell Activity in Spontaneous Preterm Birth

Anastasia Barros¹, Christopher Nold^{2,3}

¹ *University of Connecticut School of Medicine, UConn Health, Farmington, CT*

² *Department of Pediatrics, UConn Health, Farmington, CT*

³ *Department of Maternal Fetal Medicine, Hartford Hospital, Hartford, CT*

Background/Objective: Preterm birth (PTB) remains a significant contributor to neonatal morbidity and is the leading cause of neonatal mortality.¹ The most common etiology of PTB is believed to be inflammation; however, it remains unknown if an elevated baseline level of the maternal immune response early in pregnancy predisposes women to spontaneous PTB.^{2,3} This study aimed to determine if increased levels of vaginal pro-inflammatory cytokines and systemic immune cell activation prior to 14 weeks gestation increased the risk of PTB.

Methods: Patients initiating prenatal care prior to 14 weeks gestation at the Women's Ambulatory Health Center at Hartford Hospital were recruited and voluntarily consented. At their first prenatal visit, a vaginal swab and blood samples were obtained. Patients were followed for their gestational age at delivery. Five patients delivering preterm (cases) were matched with ten patients delivering at term (controls) based on age, BMI, smoking status and ethnicity. A cytokine multiplex analysis was used to assess the following pro-inflammatory cytokines: GM-CSF, IL-1b, IL-6, RANTES and TNF α from the vaginal swabs and the maternal serum. An ELISA assay was used to assess the concentration of IL-6 expressed from peripheral mononuclear blood cells isolated from maternal serum. These results were analyzed using a t test with a $p < 0.05$ considered to be significant.

Results: No significant difference was found in the concentration of GM-CSF, IL-1b, IL-6, RANTES or TNF α in the serum or the vaginal swabs between patients in the case and control groups.

Conclusions: Concentrations of the pro-inflammatory cytokines GM-CSF, IL-1b, IL-6, RANTES and TNF α in the genital tract or in the serum did not differ between the cases and controls in this study. Although a variety of cytokines were tested, sample size was limited due to low number of pre term births. Further research is needed to determine how the maternal immune system leads to a pro-inflammatory response and ultimately preterm birth.

Supported by: Department of Women's Health at Hartford Hospital

References:

1. Goldenberg R, Culhane J, Iams J, Romero R. Epidemiology and causes of preterm birth. *Lancet* 2008;371:75-84.
2. Hameed C, Tejani N, Verma UL, Archbald F. Silent chorioamnionitis as a cause of preterm labor refractory to tocolytic therapy. *Am J Obstet Gynecol* 1984;149:726-30.
3. Savasan ZA, Chaiworapongsa T, Romero R, et al. Interleukin-19 in fetal systemic inflammation. *J Matern Fetal Neonatal Med* 2012;25:995-1005.

Assessing Fourth Year Medical Student Skills After A Transition to Residency Course: A Pilot Study

Patrick Bergamo¹, Matthew Babcock¹, Mariann Nocera^{1,2} Alise Frallicciardi¹

¹*University of Connecticut School of Medicine, UConn Health, Farmington, CT*

²*Connecticut Childrens Medical Center*

Background/Objective: The transition from medical student to internship is stressful, potentially leading to doctors' fatigue and poor patient care. To address this transition, and in accordance with the Association of American Medical College's Core Entrustable Professional Activities for Entering Residency (CEPAERs), UConn School of Medicine (SOM) implemented a Transition to Residency Course (TTR). CEPAERs reflect broad skills expected of new physicians. Three skills included in CEPAERs that utilize simulation are, "recognize a patient requiring urgent or emergent care and initiate evaluation and management", "give or receive a patient handover to transition care responsibility", and "collaborate as a member of an interprofessional team". The aim of this project is to compare UConn SOM students' performance on these CEPAERs skills before and after completing the TTR.

Methods: As TTR is a required course for graduation, all Year 4 UConn SOM students (N=102) will conduct the simulation activities prior to taking the TTR. Of these, 18 students (the test group) will be randomly selected to perform the simulation activities after the TTR course. Student performance on each of the three CEPAER activities will be determined using modified versions of assessment tools used for similar evaluations of learner performance. Each of the three components will be assessed with multiple questions that use a Likert scale format where 1 = satisfactory and 9 = superior. For the clinical care, we will assess if students completed each of 7 steps and then will evaluate their performance on each step using a scale from 1 (poor) to 5 (excellent). Average overall pre-course component scores will be compared between the test group and the larger group using a two-sample t-test. Pre-post overall component scores and individual item scores for the test group will be compared using one-sample paired t-tests

Results: Though data has yet to be collected, the pre-course scores will identify areas where improvement is most needed. We hypothesize that after attending the TTR course, students' average assessment scores will show statistically significant ($p < 0.05$) improvement in each of the three areas. We also hypothesize that there will be several individual items that drive these changes.

Conclusions: With a focus on the CEPAERs areas that are being taught using simulation, we will determine if the TTR course is useful for improving students' performance. By investigating overall scores and individual items, our findings will also inform future TTR courses by helping to determine areas where student improvement could be bolstered.

Supported by: The UConn School of Medicine

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The Development of Instructional Musculoskeletal Physical Exam Resources Targeted Towards Medical Students

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Background/Objectives: Clinical instruction in the musculoskeletal (MSK) physical exam (PE) is critical for nearly all medical practitioners. During the course of pre-clinical education in the MSK PE at the University of Connecticut's Delivery of Clinical Care (DoCC) course, a dearth of up-to-date, high-quality resources was identified. A quality improvement initiative was thereby commenced in an attempt to create improved MSK PE resources for DoCC and to assess the impact that these new resources had on student satisfaction of resources and mastery of the MSK PE.

Methods: Three MSK areas of focus were identified for this project: the shoulder, the knee, and the low back. PowerPoint and video resources were produced in conjunction with faculty in the Department of Orthopedics. These resources included methodology and demonstration of proper PE techniques, as well as educational material regarding anatomy and common pathologies, using an established textbook for reference.¹ Student feedback of DoCC MSK resources, student performance on clinical skills examinations, and student performance on written MSK questions were analyzed, stratified by students utilizing the original MSK resources compared with students utilizing updated MSK resources.

Results: Video and PowerPoint resources for MSK PE were developed and introduced to the DoCC pre-clinical course after the 2016/17 course. Evaluations completed by 100 pre-intervention and 131 post-intervention students were analyzed. Student satisfaction regarding MSK PE resources significantly improved after implementation of updated materials (mean percent increase in Likert rating, pre- to post-intervention: 20.6%; 95% CI 15.6%–25.8%, $p<.0001$). Student perception of preparatory workload manageability also significantly improved after implementation of updated materials (mean percent increase in Likert rating, pre- to post-intervention: 23.6%; 95% CI 18.4%–29.0%, $p<.0001$). Performance on written examination questions improved between students using old versus updated resources (2016/17: 63.5% vs. 2017/18: 87.6% vs. 2018/19: 88.5%).

Conclusions: Student satisfaction is improved by utilizing streamlined, tailored resources for MSK PE. Success was achieved with implementation of MSK PE resources, and the development of additional resources has been completed. These have been delivered to DoCC leadership along with a summary of statistical findings. Statistical analysis will be undertaken to confirm student preference of these additional updated resources.

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Assessment of Cardiac Abnormalities in Sickle Cell Disease Patients Using Echocardiography

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Background: Sickle Cell Disease (SCD) is characterized by chronic anemia and recurrent ischemia-reperfusion episodes that contribute to high output heart failure. The effects of SCD on the heart are significantly underrecognized.

Methods: SCD patients who underwent echocardiography between March 2016 and March 2018 were retrospectively analyzed. Patients with reduced Left Ventricular Ejection Fraction (LVEF) and valvular heart disease were excluded. Cardiac chamber size, systolic and diastolic function parameters, and LV and RV strain were compared between hemoglobin SS (most severe form of SCD) and SC (less severe form) subtypes and against healthy controls. Wilcoxon signed rank test was used for statistical analysis.

Results: SS patients (n = 48, mean age 31.9) had lower mean hemoglobin 8.9 g/dl vs 11.3 g/dl (p < 0.001) and hematocrit 25.8% vs 31.4% (p = 0.008) and higher LDH 437 IU/L vs 258 IU/L (p < 0.001) compared to SC patients (n = 11, mean age 34.4). Both SS and SC patients had worse diastolic function compared to healthy controls: higher E velocity 98.9 cm/s (SS), 86.4 cm/s (SC), 76.4 cm/s (control) (SS vs control, p < 0.01; SC vs control, p < 0.05) and higher E/A ratio 1.76 (SS), 1.59 (SC), 1.15 (control) (SS vs control, p < 0.001; SC vs control, p < 0.01). SS patients had larger indexed left atrial volume compared to SC patients (39.3 ml/m² vs 28.4 ml/m², p = 0.007). There was no significant difference in LVEF, left ventricular global longitudinal strain, or right ventricular strain between SS and SC subtypes compared to healthy controls. Furthermore, SS patients with a serum LDH > 500 IU/L had higher E/e' ratio (11.3 vs 7.2, p=0.001) and larger indexed Left Ventricular End Diastolic Volume (LVEDVi) (80.8 ml/m² vs 53.4 ml/m², p=0.002) compared to SS patients with LDH < 500 IU/L.

Conclusion: SCD genotype adversely determines the degree of cardiac dysfunction in patients with SCD. LVEDVi, left atrial size, E velocity, E/A ratio, and E/e' ratio may serve as useful echocardiographic parameters to follow in this patient population. Serum LDH has been associated with poor clinical outcomes in patients with SCD, and as demonstrated by our study, it also portends worsening cardiac function in this population at high risk for heart failure.

Evaluating the Dose-Response of Moderate to Vigorous Physical Activity on Serum Lipids Using Accelerometer Data

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BACKGROUND: In the United States, over 600,000 people die each year from heart disease, making it the leading cause of death. Elevated cholesterol is well known to be associated with a greater risk of heart disease. Increased concentrations of low-density lipoprotein (LDL) cholesterol particles are associated with increasing rates of accumulation of atherosclerosis [1]. Current ACA/ACC Guidelines suggest that aerobic physical activity (PA) should be encouraged to reduce LDL and non-high-density lipoprotein (non-HDL) levels [2]. However, the research supporting these claims is not well substantiated. In fact, some research suggests that physical activity has little effect on LDL and non-HDL cholesterol levels, while it is able to increase HDL [3,4]. **PURPOSE:** To investigate associations of physical activity intensities, sex, and high dose statins with lipid levels (HDL, LDL, triglycerides and total cholesterol). **METHODS:** Healthy adults who were statin naïve (n=440) wore accelerometers for 96 hours to assess their normal PA levels prior to a baseline visit, and a follow-up visit 6 months later after treatment with either placebo or high dose statin (80mg atorvastatin), with blood lipids collected at each visit [5]. Using SPSS statistical software, we ran multiple linear regressions to assess relationships between the independent variables, physical activity intensity, age, BMI and sex, and the dependent variables, HDL, LDL, triglycerides and total cholesterol. We also looked at these relationships within the male and female participants alone at baseline. **RESULTS:** In women subjects at the baseline visit, time spent in moderate to vigorous PA, age, and BMI accounted for 15.3% of the variation in HDL (Beta = .229; Std. error = 0.023; p = 0.004). In male subjects at the baseline visit, time spent in moderate to vigorous PA, age, and BMI accounted for only 7.6% of variation in HDL, with the contribution of moderate to vigorous PA not statistically significant (p = 0.884). Within both the statin and placebo groups, the baseline time spent in moderate to vigorous activity along with age, sex, and BMI did not statistically significantly contribute to the change in LDL, HDL or triglycerides over the course of the 6 month study. While statin use accounted for 61.4% of the variation in LDL changes over 6 months (Standardized Beta = 0.757; Std error = 2.436, p = <0.001), there was no statistically significant contribution of the addition of moderate to vigorous PA (p = 0.417). **CONCLUSION:** Our results add to the growing body of data supporting that physical activity modifies HDL but not LDL, and furthermore suggests that women may benefit more from the chronic effects of physical activity on HDL. More work must be done to substantiate these findings to confirm our observations prospectively.

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Structural Predictors of Long-Term Outcomes in Late-Life Depression

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Background: Late-life depression (LLD) can be defined as depression affecting adults aged 60 years and older. LLD is commonly associated with structural brain changes, particularly in the hippocampus, which has neural connections to areas involved in emotion processing. Several magnetic resonance imaging (MRI) studies have reported decreased hippocampal volumes in individuals with LLD. Reduced hippocampal volumes have been associated with lower short-term remission rates. This study examines hippocampal volume as a potential predictor of long-term depression outcomes in a single LLD cohort.

Methods: We studied 39 depressed individuals enrolled in a longitudinal study who were treated with antidepressant medications. Inclusion criteria were age over 60 years, current psychiatrist-based diagnosis of major depression, and the ability to undergo an MRI. Exclusion criteria were dementia and other neurological or neuropsychiatric illness besides depression. Baseline and 1-year Montgomery-Asberg Depression Rating Scale (MADRS) scores were obtained via interview with a geriatric psychiatrist. Subjects also had five high-resolution T1-weighted MPRAGE scans (Siemens 3T Skyra) with voxelsize of 0.8x0.8x0.8mm³, which were processed using FREESURFER (version 5.1.0) protocols to determine left and right hippocampal volumes. Hippocampal volumes were standardized for total gray matter volume. Clinical follow-up was done at 1 year. The primary outcome was MADRS score at 1 year. Individual regression models tested the association between hippocampal volume and MADRS score controlling for baseline depression.

Results: Greater left hippocampal volumes were significantly associated with lower MADRS scores at 1 year (coefficient estimate = -17.8, standard error = 8.3, $p = 0.041$) when controlling for age, sex, and baseline MADRS.

Conclusions: Subjects with a more intact hippocampus had a greater response to antidepressant medications. Our results support those of a previous study on hippocampal volumes and acute antidepressant treatment response. Further research is needed to understand the biological basis of the connection between hippocampal volume loss and antidepressant response. As the hippocampus expresses a variety of serotonin receptors, the link between change in hippocampal structure and limited antidepressant response may be mediated through loss of hippocampal serotonergic activity.

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A 'Primary Care Office of the Future' Innovation Workshop Changes Medical Student Attitudes Toward Primary Care and Innovation

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Background/Objectives: Innovations in primary care are critical in a time of primary care physician shortage and shifting student career priorities¹. Despite numerous interventions aimed to influence primary care career choice, there lacks investigation into the impact of student engagement with primary care innovation. Our study evaluates how a workshop form of Connecticut Institute for Primary Innovation's (CIPCI) Primary Care Office of the Future² affects medical student attitudes toward primary care and innovation thinking.

Methods: We transformed CIPCI's Primary Care Office of the Future demonstration into a workshop experience for students. Following a pilot at a Frank H. Netter MD School of Medicine, we incorporated feedback from eight students. We designed pre and post surveys from validated items published in primary care and innovation literature. Students from University of Connecticut School of Medicine were recruited by e-mail for the study. Thirteen students participated in a standardized 90-minute workshop facilitated by two trained medical students. Participants completed two web-based surveys using a 5-pt Likert scale. We evaluated data using paired data averages and T-test analysis.

Results: Participants were from all 4 years of medical school, with mean age 24.9±2.56 and 69% female. Notably, 85% were interested in primary care prior to the workshop. On average, participation increased participant belief that primary care incorporates new technologies ($p=.01$) and in the importance of the physical space of a primary care office. Participation increased their belief that innovation is important in primary care, as well as in their skills at finding areas of improvement and in generating new ideas for practice ($p=.04$). They felt empowered to implement these changes in their future positions ($p=.03$), but not in their current positions as students.

Conclusions: A standardized 'Primary Care Office of the Future' workshop changes medical student perception of primary care and impacts measures of *inspiration*; it increases student belief that they can generate new ideas for medical practice and implement them in the future. It does not *empower* change implementation in their current roles. We conclude that student engagement with primary care innovations changes perception of a primary care career and increases inspiration tenets of innovation thinking.

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Examining Patterns of Hip Fracture Rates in a New England Hospital

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Background/Objectives: Mechanical falls leading to fracture are increasingly common in the elderly population. Hip/femur fracture is of particular interest within this population due to its high risk of associated disability and/or mortality.

Methods: A retrospective observational analysis of hip fracture was approved by the Hartford Healthcare IRB. Patients ≥ 65 years old presenting to The Hospital of Central Connecticut with femur fracture over a three-year period were included in the study. The data was examined for patterns of femur fracture between men and women, as well as patterns of fracture amongst three differing age groups.

Results: We found a significant relationship between gender and mechanism of injury, in that women were more likely to sustain hip fracture through a fall indoors compared to men. There were no significant differences between frequency of hip fracture amongst three age groups within the study sample, and there were no significant differences between the season of fracture, age and/or gender.

Conclusions: These findings add to the existing literature regarding hip fracture which is important given its high morbidity and mortality and the healthcare resources utilized in caring for these patients. With more data regarding patterns and frequency of hip fracture, healthcare providers can be better equipped to both prevent and treat this condition.

Supported by: The Hospital of Central Connecticut

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Impact of Computerized Mannequin Simulation Cases on Medical Student Understanding of Management Concepts

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Background: It is well-established that exposure to clinical simulation enhances medical students' scientific and clinical knowledge, comfort with procedures, and teamwork^{1,2}. As medical education continues to evolve, a greater emphasis is being placed on early exposure to clinical simulation during medical school¹. Simulation allows students to learn and practice critical skills in a safe, controlled environment where there is no risk of harm to patients. Simulations can be observed and recorded, allowing for an in-depth debriefing to occur between students and preceptors³.

Objective: The goal of this study was to develop curricular materials in the form of faculty guides for clinical simulation cases which are suitable for preclinical undergraduate medical education, and to assess the effectiveness of those materials.

Methods: Faculty guides were developed for two simulated cases, and IRB exemption was approved by UCONN Health IRB. Participants were recruited from first and second year classes at UCONN School of Medicine. They completed a pre-test with questions related to "chest pain," then participated in a simulated case of either myocardial infarction (MI) or pulmonary embolism (PE) using a high fidelity manikin (Sim Man 3G, Laerdal). The cases were debriefed by Emergency Medicine residents or faculty, and students took an identical post-test^{4,5}. Test scores were compared using a paired t-test.

Results: Sixteen first and second-year medical students participated in the study; six in the MI case and ten in the PE case. In aggregate, post-test scores increased by a mean difference of 20% [p=0.018; 95% CI 3.96 – 36.04]. Broken into subgroups by case, the MI mean difference was 50% [p=0.038; 95% CI 3.04 – 70.29] and the mean difference for the PE case did not reach statistical significance at p=0.244.

Conclusion: Mean post-test scores improved for both cases, although only the MI case reached statistical significance. The average pre- and post-test scores were both much lower for the PE case than for the MI case, which could indicate that the test was too difficult for participants. Future research should be done with this case after correcting the test for difficulty level or changing the case or debrief.

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Self-Management Skills of Patients with Diabetes Treated at The Endocrinology Clinic at UConn Health

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This project aims to analyze the habits and self-management skills of patients with diabetes in the Endocrinology clinic at UConn Health. Diabetes self-management education (DSME) has been correlated with improved patient outcomes and decreased healthcare spending [1]. Increased self-management skills in this population has also been positively associated with them receiving higher levels of comprehensive clinical care [1]. This study will utilize hemoglobin A1c scores and validated surveys to assess potential gaps in knowledge and self-care in patients with diabetes. Comparisons of participants and non-participants in the Diabetes Self-Management Education Program at UConn will also help in analyzing its effectiveness. The surveys will consist of questions asking for the subject's sex, location of last DSME course, and the subject's last A1c score, to the best of their memory. There will also be a 16 question validated survey, the Diabetes Self-Management Questionnaire (DSMQ), to assess subjects' self-care [2]. For all measures that are continuous in nature, statistics such as sample sizes, medians, means, modes, and standard deviations will be calculated. Bivariate analysis between the subjects' DSME status (attended or did not attend) and DSMQ/ knowledge/ hemoglobin A1c values will be calculated after the data has been collected in order to detect possible trends. Portions of the DSMQ will be subdivided into subclasses of scores that assess glucose management, physical activity, health care use, and dietary control.

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Incorporating Integrative Medicine (IM) into the UCONN MDelta Curriculum

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Introduction: There is an increasing demand for and usage of IM - a patient-centered approach to care combining Allopathic Medicine with Complementary and Alternative Medicine (CAM) - among patients in the US.¹ Despite this, medical school education in the US has not risen to include IM as a component of their mandatory curricula.² As IM receives growing recognition for its value as an important dimension of preventative and therapeutic medicine, students would benefit from learning how to deliver some of the therapies in the office setting.³ The goal of this educational project was to create and implement a reproducible set of curricular materials on IM modalities and therapies in an effort to equip students with the knowledge to address such topics in a clinical setting.

Methods: Curricular material was created to be included in the DoCC D and E, VITALS and Home A courses in the MDelta Curriculum. Student feedback was elicited after each of the administered modules to change and enhance curricular material. A pre- and post- survey was administered assessing student knowledge, attitudes, skills and behaviors before and after the assigned interventions.

Results: 74.6% agree or strongly agree that IM is relevant to current medical practice today; 22.6% was neutral and 2.8% disagree or strongly disagree. However, only 10.5% of students agree or strongly agree that that our current curriculum provides adequate exposure to IM modalities; 45.6% was neutral and 43.9% disagree or strongly disagree. 65.5% would like to know more about IM modalities and how they can be used in patient care.

Prior to intervention, students were asked to rate their knowledge and understanding of IM: 53% poor or no knowledge; 33.1% fair; 12.2% good; 1.7% very good or excellent.

Conclusion: Self-reported knowledge was poor for IM, although students recognize the importance of IM in patient care. We predicted that increased exposure to IM in the curriculum would increase awareness of IM topics, improve ability to communicate with patients in a clinical setting, create open and favorable attitudes towards IM and increase willingness to refer patients to IM practitioners.

Supported by: LEAPS into IM Program Grant

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Is PTSD the Best Diagnosis for Children and Adolescents?

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Introduction: Currently, the “best” diagnosis for child-onset trauma sequelae is PTSD. This diagnosis was originally created for adults and unfortunately most traumatized children do not meet full diagnostic criteria.¹ Recent literature has proposed a new diagnosis, “Developmental Trauma Disorder (DTD),” which encompasses the impact of trauma on child development.^{2,3} The goal of this study is to investigate what criteria are most important in accurately diagnosing child-onset trauma sequelae. We hypothesize that DTD criteria will be rated as more important than PTSD.

Methods: Participants were recruited from UConn Health Psychiatry Department, Institute of Living, and Connecticut Children’s via email recruitment. Participants were asked to complete a web survey, which included job title, years in job, and importance level ratings of 8 criteria (5 from PTSD and 3 from DTD)³ in diagnosing child-onset trauma sequelae on a scale from 1 (not important) to 5 (extremely important).

Results: Thirty participants (18 psychiatrists, 5 psychologists, and 7 pediatricians) completed the web survey. Years of participation included <5 years (63.33%), 5-10 years (13.33%), 10-15 (6.67%), and 20+ years (16.67%). Participants rated the DTD criteria as more important in diagnosing child-onset trauma sequelae than PTSD criteria, however, results were not statistically significant. Importance level of criteria were rated as follows: 1) avoidance symptoms and intrusion symptoms (PTSD; tied for most important), 2) attentional/behavioral dysregulation (DTD), 3) emotion/somatic dysregulation (DTD), 4) negative thoughts symptoms (PTSD), 5) relational or self-dysregulation (DTD), 6) avoidance symptoms (PTSD), and 7) dissociation symptoms (PTSD; least important). Notably, dissociation was the only criterion that received “not important” ratings.

Discussion: The results of this study suggest that a better diagnosis than PTSD is imperative in order to more accurately diagnose child-onset trauma. Importantly, avoidance and dissociation (PTSD) criteria were found to be least helpful in diagnosing child-onset trauma, suggesting that these criteria may not align with the manifestation of trauma in children. Moreover, children’s abilities to regulate attention, behavior, emotions, and somatic feelings (DTD) were rated as important in diagnosing child-onset trauma, however, these criteria are absent from PTSD criteria. This study suggests that DTD is unique from the PTSD in diagnosing child-onset trauma.

Supported by: We would like to thank UConn Psychiatry Department, Institute of Living, and Connecticut Children’s residents, fellows, and faculty.

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The Role of MicroRNA-150 On the Regulation of CD4 T Cells.

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Introduction: MicroRNAs are small non-coding RNA that plays a key role in the regulation of gene expression. In hematopoietic cells MicroRNA act at the post transcriptional level to help in the fine tuning of gene expression. miR-150 is a microRNA which plays a significant role in the regulation of CD8 T cell, B cell and NK cells.

Objective: The goal of this study is to first determine the role of miR-150 in the regulation of CD4 T cells and secondly to gain an understanding of the molecular signal pathways and or genetic expression profile of miR-150^{-/-} CD4 T cells.

Methods: To understand the effect of miR-150 on CD4 T cells, miR-150^{-/-} (Knockout - KO) and miR-150^{+/+} (Wild type-WT) mice were injected with staphylococcal enterotoxin A (SEA) superantigens. SEA is a potent stimulator of the immune system resulting in an effective T cell response. After inoculation a peripheral blood sample was drawn every 2 days for cytokine and cellular analysis.

To explore the genetic profile of miR-150^{-/-} CD4 T Cell, miR-150^{-/-} and miR-150^{+/+} mice with injected with SEA superantigen. After 4 days the spleen and lymph node were extracted. Using flow cytometry CD4 T cell from KO and WT mice were sorted and selected for analysis. Using single cell 10x genomics CD4 T cells from the wild type and knockout mice were sequence and analyzed using bioinformatics software such as R programing.

Results: A knock out of miR-150 gene resulted in an increase production of IL-2 and survival of CD4 T cells after inoculation with SEA. This increased in survival observed was regardless of the cells environment. The RNASeq analysis revealed possible candidate genes for such effects. It appears that in the KO mice Ctse have increase expression while reduce expression of Gdgd3 occurs in the WT model.

Conclusion: In conclusion miR-150^{-/-} CD4 T Cells lives longer when stimulated with SEA antigen in the setting of increase IL-2 levels. RNA Sequence data revealed that Ctse gene have increase expression in the WT mice while Gdgd3 gene had a higher level of expression in the KO mice.

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Outcomes in Abdominal Wall Reconstruction at a Single Institution

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Introduction: The Ventral Hernia Working Group 2010 recommendations support the use of biologic mesh for repairing hernias in clean-contaminated and contaminated fields (class II and III wounds, respectively).^{1,2} Given recent advancements in the composition of synthetic mesh, no clear consensus exists for mesh choice in clean contaminated and contaminated hernia repair.³ Synthetic mesh has a higher tensile strength compared to biologic mesh, potentially reducing the risk of hernia recurrence in patients with class II and III wounds. The aim of this project is to describe and evaluate characteristics and outcomes of patients undergoing AWR surgery at Hartford Hospital from 2011 to the present, with the hope of addressing acceptability of synthetic mesh in complex Abdominal Wall Reconstruction (AWR).

Methods: Through this retrospective study, we will evaluate approximately 300 patients that have undergone complex AWR at Hartford Hospital through various electronic medical record interrogation. A database will be created that encompasses many factors including BMI, comorbidities, home medications, ASA score, number of prior surgeries and wound morbidities, type and size of hernia defect, mesh type, and preoperative lab values. The outcome of hernia recurrence at 1, 3, and 5-year intervals will be collected.

Results: Preliminary data collection on a portion of the study population suggest mesh type does not affect the hernia recurrence rate on those receiving complex AWR at Hartford Hospital.

Conclusions: The surgical outcomes for complex AWR are multifactorial, and can be affected by factors such as patient age, ASA score, BMI, and comorbidities. At the completion of this study, we will learn if these factors relate to the rate of hernia recurrence at the Hartford Hospital population.

Future Directions: Further research is required in a more complete patient population to be able to investigate the above hypothesis and conclusions on a scale that represents the patient population.

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Racial Disparities following MitraClip for Mitral Regurgitation

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Background: Race and socioeconomic status have been demonstrated to affect utilization of advanced cardiac procedures.¹ MitraClip is used as an alternative to surgery in high-risk patients with mitral regurgitation (MR). ²This study sought to determine whether racial disparities exist in MitraClip usage and outcomes.

Methods: We extracted clinical and demographic data from the electronic health record on all patients with MR on transthoracic echocardiography and on all patients who underwent MitraClip at Cedar-Sinai Medical Center from 2011-2019. Baseline characteristics and short-term outcomes were compared between Caucasian, African American, Asian, and a combined Other racial category.

Results: A total of 11,881 patients were diagnosed with moderate to severe or worse MR during the study period, of which 8003 (67%) were Caucasian, 1318 (11%) were African American, 734 (6%) were Asian, and 1,826 (15%) identified as Other. In unadjusted analysis, African Americans were less likely to undergo MitraClip than Caucasians (OR 0.69, p=0.005), with a non-significant trend for Asian patients (0.94, p=0.067). After controlling for age, sex and insurance status, no difference in utilization of MitraClip was found (OR for African Americans 0.89, p=0.89). Based on Kansas City Cardiomyopathy Questionnaire (KCCQ) Scores, patients improved, regardless of race, with no difference in pre- or post-procedure KCCQ Scores. However, African Americans were more likely than Caucasians to be readmitted following MitraClip (OR 5.39, p=0.013) despite controlling for age, sex and insurance status.

Conclusions: Race was not associated with differences in MitraClip utilization after controlling for baseline characteristics. The large absolute difference in the number of racial minorities undergoing MitraClip may reflect a barrier to diagnosis of severe MR and a hurdle to access intervention. While race was not associated with differences in symptomatic improvement following MitraClip, African Americans were 5 times more likely to be readmitted. This indicates that while MitraClip can improve symptoms, addressing larger health disparities is necessary in order to reduce the burden of cardiovascular disease.

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Ion Channel Gene Expression and Spontaneous Calcium Signaling of Pediatric Medulloblastoma

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Background/Objectives: Medulloblastomas affect more children in the United States than any other brain malignancy [1]. Genetic analysis of medulloblastomas described four subgroups [2]. Group 3 and group 4 medulloblastomas have particularly poor prognoses [3]. Understanding the genomic and cellular properties of these tumors may allow for more specific therapies. Aberrant expression of ion channels has been demonstrated in medulloblastoma, and antagonism of channels can suppress growth of medulloblastoma in mice [4,5]. Thus, ion channels may provide a drug target against this cancer. Previous work within our laboratory established deidentified, patient-derived medulloblastoma cultures. This project aimed to: (1) examine ion channel gene expression in these cultures and (2) characterize spontaneous calcium signals of the cultures as a readout of ion channel function. **Methods:** RNA was extracted from three primary tumors and their derived cultures. RNA sequence analysis allowed for comparison of gene count between the tumors, cultures, and other brain tumors, including astrocytoma and ependymoma. Cultured medulloblastoma underwent time-lapsed calcium imaging analysis using NIH ImageJ. A total of 216 cells from five independent wells and from one primary tumor were analyzed. An algorithm identified significant peaks in signals, defined as amplitude greater than 3.5 times the standard deviation of background fluctuation. **Results:** (1) Ion Channel Gene Expression: Medulloblastoma cultures demonstrated very similar transcriptomic profiles of ion channels to the primary tumors. Both the cultures and the primary tumors demonstrated elevated potassium channel expression relative to other brain tumors. (2) Calcium Signaling of Medulloblastoma: An average of 82 percent (± 11 percent) of cells per well demonstrated at least one peak. The average number of peaks per active neuron was 8.18 (± 8.96). The average amplitude of the peaks was a fold-change of 6.39 (± 4.26) from baseline, and average duration was 199.41 ms (± 470.66 ms). **Conclusions:** Medulloblastoma cultures and primary tumors demonstrate elevated potassium channel expression. Cells within the medulloblastoma cultures demonstrate spontaneous calcium signals; future work can explore the relationship between channel expression and this signaling behavior.

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Predicting the Wellness of Emergency Medicine Residence Based on the Wellness Programming of their Medical Education

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Background/Objectives: Mounting evidence has demonstrated that residents are struggling to maintain wellness throughout their residency training. The literature is clear that residents experience sleep deprivation (Hoonpongmanont et. al. 2014) and that “fatigue impairs cognitive and behavioral performance” (Gorman et. al. 2003) which could potentially lead to poor patient outcomes. Amongst abundant literature on wellness, no study was found that analyzed the impact of a resident’s prior medical school wellness program. This study attempts to analyze if there is any correlation between wellness in medical school and reported wellness in residency. This project hypothesizes that those who are more well in medical school will also be more well in residency, founded on the idea that wellness is something that can be learned and practiced.

Methods: A survey was written for the purposes of this study to measure the first-year residents’ experience with wellness programming and how stressed they felt during medical school and now during residency. The survey was given to two PGY-1 classes of UConn Emergency Medicine residents. An internal statistical analysis of the survey, using chi-squared testing was used to assess for any potential significant correlations. With a total n of 29, the following five specific questions were explored: does the presence of medical school wellness programming correlate with stress level in medical school? Does the presence of medical school wellness programming correlate with stress level in residency? Does reported level of participation in medical school wellness programming correlate with stress level in residency? Does increased levels of stress in medical school correlate with increased levels of stress in residency? Does one’s confidence level in a residency program’s ability to impact wellness ultimately impact their reported stress levels in residency?

Results: None of the questions asked were found to be statistically significant.

Conclusions: Thus, the hypothesis of this study was not supported. It is suspected that this study is under powered by its low n. Continuing to administer this survey to each incoming class of interns and repeating the analysis after increasing the n may yield statistically significant results.

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Evaluating the Effects of Platelet-Rich Plasma and Amniotic Viscous Fluid on Inflammatory Markers in a Human Coculture Model for Osteoarthritis

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Purpose: To assess the anti-inflammatory effects of platelet-rich plasma (PRP) and amniotic viscous fluid using a human coculture system of cartilage and synovial tissue from osteoarthritic patients.

Methods: A coculture system was created using cartilage and synovium from 3 patients undergoing total knee arthroplasty. To induce inflammation, interleukin-1b was added to each coculture. Biologic agents tested included 2 PRP concentrations (PRPL and PRPH) and 2 different samples of amniotic viscous fluid (Amnion and Flograft). Amnion was also tested with PRP to check for any additive effects. Quantitative polymerase chain reaction was used to measure gene expression of factors involved in osteoarthritis, including disintegrin and metalloproteinase with thrombospondin motifs-5 (ADAMTS-5), tissue inhibitor of metalloproteinases 1 (TIMP-1), vascular endothelial growth factor (VEGF), aggrecan, type 1 collagen, and nitric oxide, at 0, 24, 48, and 72 hours. A synthetic nonsteroidal medication, Ketorolac, was used for baseline comparison to the biologic agents.

Results: When comparing from time 0, both Amnion and Flograft resulted in significant decreases of ADAMTS-5 and TIMP-1 gene expression in cartilage and synovium for up to 72 hours. Both amniotic preparations increased collagen-1 gene expression in cartilage and decreased VEGF expression in synovium. Amnion was not found to have any effect on nitric oxide concentration at any time point ($P > .05$), as opposed to both PRP concentrations ($P < .05$). All biologic agents showed differences in gene expression similar to Ketorolac in ADAMTS-5, TIMP-1, and VEGF expression.

Conclusion: This study found that amniotic fluid had anti-inflammatory effects mostly similar to those of both PRPH and PRPL; however, no significant additive effects in reducing inflammatory gene expression were found when combining biologic agents.

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The Benefits of a Fundamentals of Laparoscopic Surgery Training Elective in 4th Year Medical Students Entering into Surgical Residencies

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Introduction: Medical students and surgical residents receive only a limited amount of time in the operating room with which to improve their surgical skills due to the demands of patient care on the floors. To that end, laparoscopic surgical simulation has emerged as an effective, time-efficient, and cost-efficient method to improve laparoscopic surgical skills. We have created an elective with the goal of teaching laparoscopic fundamentals using adult pedagogic concepts like self-learning modules, faculty-guided practice, and independent practice to effectively teach these concepts and skills. **Methods:** Our curriculum centered around daily didactic and laparoscopic simulation sessions. The didactic sessions are based off of the Fundamentals of Laparoscopic Surgery (FLS) curriculum that the students will enroll in during residency. The laparoscopic skills sessions use simulation laparoscopic trainers and involve learning each of the five core laparoscopic skills. During the guided-skills session led by laparoscopic trained OB/GYN faculty as the students are evaluated using a verified Global Rating Scale of Operative Performance (GRSOP) scoring system that was catered to our own curriculum. This scoring system was used to evaluate the skills of the student in each of the core skills before the elective and at the end. Students were provided with free access to the laparoscopic trainers for self-guided practice sessions during all business hours. For this study we created a two-week elective course that was accepted into the course catalog that was worth two elective credits for students. Our target population was fourth-year medical students entering into OB/GYN, Urology, and General surgery (the three disciplines that utilize laparoscopy the most). **Results:** This elective will take place from 3/3/20 – 3/13/20. Results are therefore pending completing of the elective. We expect to gather data from at least four subjects who have already enrolled in this study. We will gather pre-elective GRSOP scores in each of the five core laparoscopic skills the first day, a mid-point evaluation at the end of the first of two weeks, then a final evaluation on the last day. **Discussion:** Simulation is becoming widely accepted in the medical field as a cost and time effective method of training medical professionals in a variety of different scenarios, including simulation of laparoscopic surgery. The combination of self-guided learning modules, independent practice time, and faculty-guided practice sessions will serve to maximize the learning for the students who enter this elective each year.

Supported by: *UConn School of Medicine*

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Protective Isolation in Patients with Acute Myeloid Leukemia (AML) and Neutropenia

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Introduction: There is currently a critical gap in data exploring the efficacy of protective isolation (PI) practices in the oncology wards, particularly for neutropenic patients undergoing chemotherapy. Considerable institutional variation in practices is due to the lack of evidence-based and standardized decision-making in this arena. The use of PI for infection control in neutropenic oncology patients is heavily debated due to the emotional burden of placing patients in isolation and poor evidence in support of maintaining this practice. This study aims to determine the PI practices at pediatric oncology centers across North America and Australia for patients with acute myeloid leukemia (AML) and neutropenia.

Methods: We distributed a brief survey via REDCap™ to 178 pediatric cancer centers in North America and Australia. The survey asked each institution about their definition of PI as well as the criteria used to initiate and remove isolation precautions. We limited our survey to discussion of only patients with AML and neutropenia, excluding bone marrow transplant (BMT) recipients.

Results: Twenty-two of the 44 institutions who responded stated that they utilized PI for inpatients with AML. Eleven institutions utilized specific parameters to assign a patient to isolation, including clinical parameters such as fever, "infection", and AML diagnosis. Ten institutions used absolute neutrophil count (ANC) with varying thresholds to assign patients to isolation. The definition of PI varied greatly between institutions with ten institutions preventing patients from leaving the room during isolation and six institutions allowing the patient to wear a mask and walk around the unit.

Conclusion: Given the significant variation reflected in survey responses, there is a need for further discussion on maintaining PI practices. Particularly with regards to pediatric cancer patients, it is beneficial to determine whether this extreme practice is truly valuable before continuing to implement it.

Effects of Osteoporosis and Osteopenia on Inner Ear Vestibular Function

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Background/Objectives: Osteoporosis and benign paroxysmal positional vertigo (BPPV) are two highly prevalent diseases of older age, especially in postmenopausal women. Recent revelations in the potential shared mechanism of dysregulation of calcium metabolism in these disorders has prompted research on how BPPV is associated with osteoporosis. The goal of this study is to investigate potential associations between osteoporosis and otoconial degeneration, which is the presumed intermediate step leading to BPPV. This is being done by measuring an inner ear biomarker and breakdown product of otoconia, otolin-1, as well as vestibular evoked myogenic potentials (VEMPs), which are measured in response to an auditory stimulus and used to detect vestibular dysfunction including BPPV. We hypothesized if calcium metabolism dysregulation underlies both osteoporosis and BPPV, then osteoporosis should be associated with high levels of otolin-1 in the blood and abnormal VEMPs.

Methods: A prospective cohort study is currently being conducted in order to assess for correlation between osteoporosis and both levels of inner ear protein otolin-1 in the blood (measured via ELISA) as well as cervical VEMPs (cVEMPs). Statistical analysis will be performed to examine the relationships between inner ear biomarker levels, abnormal VEMPs, and each patient's osteoporosis T-score.

Results and Conclusions: We are currently still collecting data points, though plan to conduct assays for otolin-1 and statistical analyses once 10 data points are documented. This study will help to improve understanding of the potentially shared mechanisms between osteoporosis and otoconial degeneration and may lead to better prevention, diagnosis, and treatment strategies. This project serves as a complement to a literature review titled "Inner Ear Proteins as Potential Biomarkers", which discusses various proteins exclusive and non-exclusive to the inner ear and their potential role in detection of inner ear disease.

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An Analysis of Burnout and Resilience in Medical Students at the University of Connecticut School of Medicine

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Background: Burnout is a significant problem in the medical field that affects healthcare professionals at every stage of the training process and has been shown to decrease empathy in the clinical domain, increase rates of substance abuse, as well as mental illness^{1,2}. On the contrary, resilience is protective against burnout, and can be fostered in numerous ways including through social support, regular exercise, and mindfulness^{3,4,5}. The purpose of this study is to determine rates of burnout and assess the relationship between wellness practices and resilience or burnout in medical students at the University of Connecticut School of Medicine.

Methods: This cross-sectional study will be completed in January 2020. First through fourth year medical students at UConn School of Medicine will be given the opportunity to complete a 31-question anonymous online survey that takes approximately 5 minutes to complete. The survey is comprised of the Abbreviated Maslach Burnout Inventory, Brief Resilience Scale, and a health habits survey that will assess sleep, meditation, exercise, and social connectedness. First and second year students will be given class time to complete the survey and third and fourth year students will be recruited through email and on Facebook.

Results: Approximately 400 medical students will be given the opportunity to complete the survey. The relationship between study subject's demographics, wellness factors, and burnout or resilience scores will be examined. Wellness factors include quantity of exercise, meditation, and sleep as well as connectedness to faculty, friends, and family. Statistical analysis will be performed using R.

Conclusions: It is hypothesized that increased social connectedness and increased amounts of exercise, sleep, and meditation, will be positively associated with resilience and negatively associated with burnout. Additionally, it is likely that rates of burnout will be highest in second year medical students when compared to first, third, and fourth year students.

Supported by: The UConn School of Medicine Scholarship Team

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Readiness for discharge in patients undergoing laparoscopic sleeve gastrectomy

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Introduction: Due to its efficacy and safety, laparoscopic sleeve gastrectomy (LSG) is now the most popular bariatric surgery in the U.S, representing 61% of all bariatric surgeries performed.¹ Enhanced recovery after surgery (ERAS) protocols have been applied to bariatric surgery to optimize patient care and shorten hospital stay. In a recent randomized control trial (RCT) of an ERAS protocol in patients undergoing LSG at Hartford Hospital, we observed that some patients were not discharged from the hospital despite meeting readiness for discharge criteria. The objective of the present study was to quantify the delay in time between readiness for discharge and actual discharge for the patients in the ERAS RCT and to examine the underlying reasons as to why patients were not discharged despite meeting the discharge criteria.

Methods: We performed a retrospective chart review on 122 patients undergoing LSG who were randomized to either standard of care (SOC; N=65) or ERAS (N=67) in the RCT described above. The objective criteria for medically safe discharge included intake of clear liquid, ambulation, vital signs, absence of post-operative pain and absence of post-operative nausea and vomiting. Each component was scored as satisfactorily reaching the discharge criteria (score=1) or not (score=0). A summary score of 5 indicated readiness for discharge (RFD=5). For each patient, lag time was defined as the duration in time (in hours) from attaining RFD=5 to discharge from the hospital. We focused on patients who experienced a lag time of > 4 hours.

Results: Out of the 122 patients included in the study, 55 patients (45%) experienced a lag time of >4 hours. Out of these 55, 30 (54%) were delayed for social reasons such as lack of transportation, 13 (24%) reached RFD=5 but dropped to RFD≤4, extending the hospital stay until they reached RFD=5, 10 (18%) reached RFD=5 at night and were not discharged until the next day and 2 (4%) had their discharge delayed for other reasons.

Discussion: The results identify an opportunity to improve the efficiency of discharge after bariatric surgery. Addressing this challenge may require improved communication with patients regarding social factors, including their access to transportation, in order to avoid unnecessarily prolonged patient hospitalization.

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Health Impacts of Mass Incarceration: Informing Educational Modules for UCONN Medical/Dental Students

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Background/Objectives: Medical students have an obligation to be socially conscious and aware of difficulties their future patients may encounter. Incarcerated persons are a vulnerable subset of individuals with unique and complex medical needs including infectious diseases, mental illnesses, and substance abuse. More than 1 in 20 Americans will be incarcerated in their lifetimes¹. Yet, because 95% of incarcerated people return to their communities, physicians will likely care for someone impacted by mass incarceration². Currently, most early-stage medical school curricula does not address this population and its unique needs. As a first step towards developing and implementing modules to educate early-stage medical students on the challenges faced by incarcerated individuals, we sought to identify key topics/content regarding correctional medicine that should be incorporated into medical school curricula.

Methods: We conducted semi-structured qualitative interviews with faculty members from U.S. medical schools who had worked in the correctional setting and/or treated justice-involved individuals. Of the 13 individuals asked to participate in the study, 6 provided consent and were interviewed. All interviews (approximately 30 minutes in length) were audio-recorded and transcribed and a general inductive process was used to analyze the qualitative data. Using this approach, which allows for research findings to emerge through frequent or dominant themes inherent in the raw data, common themes were evaluated.

Results: The six participants included MDs (n=4), MD/Ph.D.s (n=1), and a Ph.D.(n=1) and none had received any education regarding health care for justice-involved individuals during their undergraduate medical/doctoral training. Four major themes emerged: (1) Understanding mass incarceration as a public health problem; (2) the importance of changing provider perceptions and biases towards justice-involved individuals; (3) the impact of the unique correctional environment on delivery of care during and after incarceration; (4) overcoming challenges such as patient-provider mistrust in the correctional setting.

Conclusions: Faculty insights can provide guidance regarding what aspects of correctional health should be incorporated into medical school curricula. Knowledge gained through these interviews is being used to develop cases and modules that can be incorporated into the early-stage medical school curricula, with the goal of increasing medical students' awareness regarding the health needs of the incarcerated population.

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Cost Analysis of Immigrant Health Clinic in the Hartford Region

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Background Objectives: In the US, over 45% of non-elderly undocumented immigrants are uninsured¹. This far exceeds the number of uninsured from the general population (e.g., 9.8% in Hartford in 2013²), and lack of insurance is a major barrier to healthcare. Mobile health clinics are a possible solution to providing care to this underserved population. Prior research has shown that certain mobile clinics have a return of investment of as high as 36:1³. The current study is a comprehensive cost analysis of an immigrant health clinic developed and run by medical students to provide outreach, basic medical services, and referrals to federally qualified health centers. This clinic was spearheaded by Jorge Ortiz and Amy Nwaobasi in partnership with the Connecticut Institute for Refugees and Immigrants (CIRI) and the Hispanic Health Council (HHC).

Methods: Cost analysis will be conducted by first creating a comprehensive list of all expenditures required to run the immigrant health clinic. Medical students who served as clinic coordinators will generate a list of expenditures. Each expenditure will then be assigned a cost based on market value in Connecticut. For example, salaries for attending physicians will be gathered from publically available sources and space and overhead costs will be gathered directly from our organizational partner, the HHC.

Results: Analyses are currently in process and will be completed by research day. Cost data will be presented by expenditure, and estimates of costs per patient served will be presented.

Conclusion: Results can guide future clinic development by providing key cost information on sustaining a clinic for immigrant patients. Costs can be extrapolated to different regions, settings, and providers and can be used to inform grant applications and fundraising efforts. Future studies should examine cost-effectiveness. This line of research will inform strategies to increase and establish healthcare access for immigrant populations.

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Evaluating the Quality and Determinants of Maternal Healthcare in Kisoro, Uganda

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Background: Obstetrical conditions continue to be important causes of preventable morbidity in sub-Saharan Africa. The World Health Organization (WHO) has issued guidelines on the recommended standard of care for antenatal care (ANC) and postnatal care (PNC) in developing nations¹. Previous investigation established a baseline measurement of maternal healthcare in the Kisoro District of Southwestern Uganda in 2017. Since then, the Clare Nsenga Foundation (CNF) health center has undergone an expansion of maternity-related services. A maternity ward has been built and accepting patients since May 2018. The goal of this study was to investigate the impact that this expansion of services has had on maternal healthcare in Kisoro.

Methods: Participants were women of any age who had a baby within the last year. The women were administered a survey assessing sociodemographic information and elements of ANC and PNC received during the last pregnancy. This was compared with WHO-defined standards to determine rates of compliance with each recommendation. Initial data was gathered in June-August 2017 prior to the opening of the CNF Maternity ward in 2018. The protocol was repeated one year later during May 2019. T-Tests, ANOVA, and linear regression were used to characterize the data.

Results: One hundred and forty six women participated. The average number of ANC guidelines met was higher in the 2017 cohort compared to the 2019 cohort, with an ANC composite score of 15.56 +/- 2.64 and 13.55 +/- 3.01 respectively. The average number of PNC guidelines met was higher in 2017 compared to 2019, with a PNC composite score of 10.816 +/- 1.392 and 7.203 +/- 2.632 respectively. The women who delivered at Clare Nsenga on average met more PNC guidelines than those who delivered at two other local health centers, Kisoro District Hospital and Nyabuhuniko Health Center, with a mean difference of 3.4 +/- 1.1 and 3.2 +/- 1.2 respectively.

Conclusion: Between 2017 and 2019, the compliance with WHO guidelines has decreased in the region. Although fewer women delivered at Clare Nsenga Maternity Ward than other local health centers, the women who did deliver there on average met more of the PNC guidelines.

Supported by: *Professors Judy Lewis and Stephen L. Schensul Fund for Global Public Health and The UConn School of Medicine Summer Research Fellowship*

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The Development of Instructional Musculoskeletal Physical Exam Resources Targeted Towards Medical Students

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Background/Objectives: Clinical instruction in the musculoskeletal (MSK) physical exam (PE) is critical for nearly all medical practitioners. During the course of pre-clinical education in the MSK PE at the University of Connecticut's Delivery of Clinical Care (DoCC) course, a dearth of up-to-date, high-quality resources was identified. A quality improvement initiative was thereby commenced in an attempt to create improved MSK PE resources for DoCC and to assess the impact that these new resources had on student satisfaction of resources and mastery of the MSK PE.

Methods: Three MSK areas of focus were identified for this project: the shoulder, the knee, and the low back. PowerPoint and video resources were produced in conjunction with faculty in the Department of Orthopedics. These resources included methodology and demonstration of proper PE techniques, as well as educational material regarding anatomy and common pathologies, using an established textbook for reference.¹ Student feedback of DoCC MSK resources, student performance on clinical skills examinations, and student performance on written MSK questions were analyzed, stratified by students utilizing the original MSK resources compared with students utilizing updated MSK resources.

Results: Video and PowerPoint resources for MSK PE were developed and introduced to the DoCC pre-clinical course after the 2016/17 course. Evaluations completed by 100 pre-intervention and 131 post-intervention students were analyzed. Student satisfaction regarding MSK PE resources significantly improved after implementation of updated materials (mean percent increase in Likert rating, pre- to post-intervention: 20.6%; 95% CI 15.6%–25.8%, $p<.0001$). Student perception of preparatory workload manageability also significantly improved after implementation of updated materials (mean percent increase in Likert rating, pre- to post-intervention: 23.6%; 95% CI 18.4%–29.0%, $p<.0001$). Performance on written examination questions improved between students using old versus updated resources (2016/17: 63.5% vs. 2017/18: 87.6% vs. 2018/19: 88.5%).

Conclusions: Student satisfaction is improved by utilizing streamlined, tailored resources for MSK PE. Success was achieved with implementation of MSK PE resources, and the development of additional resources has been completed. These have been delivered to DoCC leadership along with a summary of statistical findings. Statistical analysis will be undertaken to confirm student preference of these additional updated resources.

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Evaluation of Echocardiography Screening Guidelines in Patients Who Have Received Anthracyclines or Trastuzumab Chemotherapy

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Background: Improvements in cancer therapies over the past several decades have led to an improvement in survival of cancer patients. Currently, there are 15.5 million cancer survivors living in the United States, and these numbers are predicted to grow (1). With this increase in survival, healthcare providers have become more aware of side effects of cancer treatments. Some chemotherapeutic agents, most notably anthracyclines (doxorubicin, epirubicin, mitoxantrone, idarubicin) and trastuzumab, are known to cause cardiovascular complications (2). Chemotherapy-related cardiac dysfunction (CTRCD), defined by the European Association of Cardiovascular Imaging (EACVI) as a drop in left ventricular ejection fraction (LVEF) by ten percentage points to a value below 53%, or clinical symptoms of heart failure, is the second leading cause of morbidity and mortality among cancer survivors (3). In order to prevent patients from developing CTRCD, several organizations have published recommendations about how and when to screen patients who have received anthracyclines or trastuzumab. Echocardiography is commonly used to screen patients for CTRCD. However, variability in the definition of CTRCD and the lack of evidence-based guidelines have led to a diverse array of recommendations (4).

Objectives/Methods: The goals of this study were to analyze how well certain guidelines are being followed by the cardio-oncology clinic at UConn Health, and to review the literature to assess the clinical utility of echocardiography to screen for CTRCD. 33 patients from the cardio-oncology clinic at UConn Health who had received anthracyclines, and 10 patients who had received trastuzumab were recruited, and a retrospective chart review was conducted to analyze if the frequency with which the patients received echocardiograms was in accordance with EACVI guidelines.

Results: Echocardiography screening at UConn Health adhered more closely to EACVI guidelines during baseline assessment, and became less adherent to guidelines at later time points. A review of the evidence behind using echocardiography to assess for CTRCD highlights the need for more randomized controlled trials to validate screening and surveillance schedules based on patient-centered outcomes.

Conclusion: The development and validation of a clinical scoring metric to individualize screening and surveillance regimens may help to standardize screening schedules and direct resources to patients who would benefit the most from cardiac surveillance.

Supported by: University of Connecticut School of Medicine

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Quality of Care in Medical Student-Run Free Health Clinics: An Evaluation of Quality Measures of Free and Charitable Health Clinics and Their Application at UConn School of Medicine Student-Run Free Health Clinics and Migrant Farm Workers Clinic

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Background: The University of Connecticut School of Medicine has a rich history of improving students' clinical education while simultaneously addressing the health inequity affecting poor and uninsured patients in the state through the implementation of student-run free clinics (SRFCs), including the Migrant Farm Workers Clinic (MFWC). It is important for medical students to obtain experience and education in quality improvement strategies to build a better understanding of the systems-based practices they will meet when they enter the workforce, but such information is often absent in medical school curricula. The purpose of this study is to determine a set of outcome metrics that may be applied to SRFCs to improve the quality of care provided and increase student understanding of systems-based practice.

Methods: Outcome metrics from the last five years (2013-2018) of MFWC were obtained with partnership from CRVFHP. Data points were tallied and analyzed for diagnoses encountered and screenings performed on the farms. Data was also examined for referrals to CRVFHP Partner Agency Health Centers and follow-up. Data was compared against national goals as outlined in *Healthy People 2020*.

Results: Of the patients seen at MFWC from 2013-2018, the vast majority (90%) were men; the most common age group treated was 50-59 years. Patient demographics have been changing such that the Jamaican population is increasing whereas the Mexican population is decreasing. The percentage of patient referrals sent to partner Federally Qualified Health Centers (FQHCs) increased each year, but the percentage of actual patient follow-up with these organizations remained low. The two most common diagnoses encountered were hypertension and diabetes.

Conclusions: Results suggest our population is growing older and is at highest risk for cardiovascular disease. Despite increasing referrals, patients are not following up for management of chronic illness. HRSA process measures MFWC has begun reporting are BMI, tobacco use, and depression screenings. Based on these results, recommendations are to increase registrations to Migrant Clinicians Network, implement cardiovascular disease educational initiatives, and increase rate of student clinician completion of screenings during encounters.

Future Directions: Future work must assess barriers to successful follow-up with FQHCs as well as the success of educational initiatives implemented on farms as measured through patient satisfaction and improved clinical outcomes.

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Factors Affecting Hospital Stay of Acute Pancreatitis Patients

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Background: The admission of patients with a principal diagnosis of acute pancreatitis (AP) in the United States has increased from 164, 776 in 1997, to 275,170 in 2012 (Wadhwa, 2017). The treatment of AP includes a bowel rest, pain management and other investigative procedures to resolve the underlying cause. This study aims to investigate factors that increase hospital stay in these patients such as the use of opioids, cause of the pancreatitis, and effects of early feeding.

Methods: This study was a retrospective study looking at patients admitted with a principal diagnosis of AP from April 2017 to April 2018 to John Dempsey Hospital in Connecticut. The variables collected include, but are not limited to, demographic data, history of acute symptoms, and pain management during hospitalization, and time until oral feeding.

Results: We identified 83 patients with acute pancreatitis, of which 71 met our criteria. 55% of patients were male. 79% of all patients were White while 11% were African American. Using the Charlson Comorbidity Index (CCI), 76% fit in the first 3 classifications with 28% of this group having an index score of 0. Gallstone and alcoholic pancreatitis accounted for 66% of the cases while 33.8% of the causes were undetermined. The average day of hospitalization was 4.6 days while the average patient received 33 mg of oral morphine/ day of hospital stay. BISAP scoring is included in our model to account for AP severity. Our multiple linear regression model included variables such as, CCI, time until feeding, po morphine mg eq/day, BISAP score, BMI and length of hospitalization. Time until feeding was the only variable demonstrating an effect on hospital stay with a beta of 1.036 ($p=.000$). PO morphine mg eq/day did not show a significant association with a beta of .006 ($p=.459$).

Conclusion: With this sample size, there was no association between po morphine mg eq/day with hospital stay. This study also reconfirms that early feeding patients with acute pancreatitis results in a shorter hospital stay.

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Examining the Role of Adverse Childhood Experiences on the Development of Chronic Illness: A Literature Review and Educational Tool

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Background:

The CDC estimates that over 60% of adults in the U.S. have a history of adverse childhood experiences (ACEs) [2]. A significant body of research has demonstrated an association between ACEs and a multitude of adult chronic illnesses [2]. Despite a robust body of literature on this topic, traditional medical curriculum does not adequately address the relationship between ACEs and adult disease. This project aims to enrich medical student understanding of the relationship between ACEs and adult health through a review of existing literature and the development of an interactive educational tool.

Methods:

A review of literature on this topic was conducted using scholarly databases, beginning with Felitti et al's landmark paper [1]. The focus of this review was to identify the variety of ACEs that are associated with chronic illness, specific health conditions that are associated with a history of ACEs, and clinical interventions that may improve health outcomes in patients with a history of ACEs. Key information was then consolidated into an interactive learning module [3] designed for medical students using the education software Prezi. The module addresses ACEs and their significance, their impact on adult health behaviors, their connection to adult medical illness, and their impact on mental health issues. The module concludes with a discussion of clinical implications, strategies to prevent ACEs and their impact, an introduction to trauma-informed care, and links to valuable resources for patients and providers. Future plans include assessing the student perspective on the efficacy and utility of the educational module, as well as potential formal incorporation into the medical school curriculum.

Results:

The perspective on this educational module is currently being evaluated using a post-module survey of students, medical educators, and healthcare providers. The survey addresses participants' knowledge of and attitudes toward this topic. Additionally, it evaluates the perceived utility of the module, as well as specifics regarding the potential value in further incorporation into the formal medical school curriculum.

Conclusion:

It is anticipated that the educational component of this project will increase medical students' awareness of the relationship between adverse childhood experiences and chronic illness. After completing this educational module, medical students and other health professionals will be better equipped to address the complex health needs of patients with a history of adverse childhood experiences and will be able to provide more comprehensive and effective care.

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Healthcare Expense Following Sleeve Gastrectomy vs. Roux-en-Y Gastric Bypass

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Background: In the United States, 61% of adults are overweight and 27% are obese [1]. Due to obesity's overwhelming prevalence in America, bariatric surgery as a treatment is becoming increasingly utilized. There is a substantial amount of literature published on the efficacy and side effect profile of the sleeve gastrectomy (SG) and the Roux-en-Y gastric bypass (RYGB) [2], but there is little information on the healthcare utilization following the procedures and their associated long-term costs. Drawing on published followup data of local bariatric procedures, we further characterize the short-term and long-term costs of each surgery. Here, we generate a projection of the non-routine financial burden of each procedure drawing from publically available cost estimates.

Methods: The cohort examined was originally investigated in Seip et. al [3]. It includes all patients at Hartford Hospital who underwent SG or RYGB as their initial weight loss surgery between 4/1/2013 and 3/31/2015. These patients were followed for two years, over which the number of nonroutine ED visits, inpatient admissions, and outpatient appointments were totaled. Other procedures these patients required secondary to their bariatric surgery, such as imaging studies or subsequent surgeries, were also noted. In an effort to assign a more definitive cost to both the SG and RYGB, we matched Medicare costs and cost estimates from literature to each followup procedure and healthcare visit, resulting in a more comparable cost estimate of the two surgeries [4, 5].

Results: Drawing from data found in Table 4 of Seip et. al., the expected cost of followup after SG was found to be \$2,491. In comparison, the expected cost following RYGB was \$4,736. This takes into account both the resource utilization rate per patient and the estimated cost of the resource, along with frequency of provider encounters and cost estimates of those. This gives a more concrete estimate of the expense incurred by these procedures.

Conclusions: Whereas the adverse event rate of the RYGB and the SG were previously established, the corresponding cost was not. , the RYGB procedure appears to result in a greater economic burden to both the healthcare system and patients.

Supported by: UConn School of Medicine

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Evaluation of the University of Connecticut School of Medicine Clerkship Readiness: Comparing the MDelta and Legacy Curriculum

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Background/Objective: The University of Connecticut has recently underwent a curricular change from the traditional two-year preclinical Legacy curriculum (LC) to 18 months of MDelta Curriculum (MDC). The curricular change brings into questions about effectiveness in the curricular change. The perception of clerkship readiness was used as a main outcome to quantify the student outcomes in two curricula. The outcome is important because starting clerkships is the first major transition in medical education and lack of adequate preparation leads to increased levels of stress and anxiety in students.¹ The goal of this study was to compare perceptions of readiness for clerkship between the two curricula.

Methods: The suggested study collected the data by surveying the Readiness for Clerkship assessment² that is a composed of 42-questions survey (37 Likert scale questions and 5 open-ended questions) for three years. Students were asked to specify their level of competencies using 5 point Likert scale where 1 = unacceptable level and 5= extremely high level. The survey was administered via Oasis Scheduling Software to medical students (1 year of LC: (n) = 96, and 2 years of MDC: (n)=212) during their third year at least 6 months after starting clerkships. As the first step, descriptive statistics in responses to the Likert scale questions were evaluated in order to provide average score by each respondent. Then, the average of overall summative score as well as the responses to each individual question were compared using two-sample t-test to determine the differences between LC and MDC and significant level was taken as 0.05. Lastly, open-ended questions were assessed for themes.

Results: Out of 308, medical students who responded valid and complete responses for 42 questions were 235 (76%) which is composed of 80 (83%) from LC and 155 (73%) from MDC. The average clerkship readiness scores, were 3.38 (standard deviation [SD] =0.55) for LC and 3.29 (SD = 0.42) for MDC and the statistically significant difference in the overall average scores were not found ($p = 0.1$). Evaluating the differences in the responses for individual questions, we found nine questions having significant differences in readiness favoring the LC compared to MDC. Nine questions having statistically better scores in clerkship readiness included: 1) Communication with patients and family (LC: 3.3 ± 0.84 vs. MDC: 3.0 ± 0.73 $p = 0.004$); 2) Communication with medical team (LC: 3.3 ± 0.79 vs. MDC 3.1 ± 0.66 ; $p = 0.004$); 3) Interpretation of relevant imaging reports (LC: 3.1 ± 0.86 vs. MDC: 2.5 ± 0.96 ; $p < 0.0001$, $p < 0.05$); 4) Explanation of pathology and pathophysiology of patient's problem (LC: 3.1 ± 0.86 vs. MDC: 2.4 ± 0.93 ; $p < 0.0001$); 5) Comprehension of anatomy for physical exams and interventions (LC: 3.1 ± 0.79 vs. MDC: 2.8 ± 0.75 ; $p = 0.003$); 6) Proposing a differential diagnosis (LC: 3.0 ± 0.85 vs. MDC: 2.7 ± 0.79 ; $p = 0.004$); 7) Evaluation of information sources (LC: 3.4 ± 0.91 vs. MDC 3.1 ± 0.78 ; $p = 0.02$); 8) Self-care (LC: 3.2 ± 1.08 vs. MDC: 2.9 ± 1.07 ; $p = 0.03$); 9) Explanation of cost-effectiveness to patients (LC 2.9 ± 1.00 vs. MDC 2.6 ± 1.05 ; $p=0.005$). From the thematic analysis, open-ended questions revealed that LC and MDC perceived doctoring course (PCM/DOCC), longitudinal clinic (SCP/CLIC), and Clinical Skills as positively impacting perception of clerkship readiness. The two curricula indicated different areas in which they felt they could have been better prepared for clerkship. LC reported imaging, focused histories and physical examinations, managing physical exhaustion, and inpatient management; while MDC indicated basic sciences, pathophysiology, and pharmacology.

Conclusions: Based on our findings, overall perception of readiness for clerkship does not differ statistically between LC and MDC, with the average readiness score above satisfactory level of competence in both curricula. More information and detailed evaluation are needed before conclusions can be drawn regarding specific competencies.

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Tracking Chronic Opioid Prescribing Metrics for Quality Improvement – What Happens to Patients who Fall off the List?

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Background/Objectives: In the past fifteen years, there has been a reported 370% increase in opioid overdose deaths in the United States.¹ In light of this epidemic, there has been movement to address the safe prescribing of long term opioid therapy (LTOT) as issues of “doctor-shopping” and limited evidence of impact on pain/function have been identified.¹ While this movement has contributed to a decrease in the number of new opioid prescriptions, providers are faced with the question of how to treat patients who have been on LTOT for years.² In evaluating the outcomes of this population, a recent study noted that patients on LTOT demonstrate a higher mortality rate, as well as a higher rate of overdose-related deaths when the opioid prescription had been discontinued.³ In line with national and state guidelines, UConn Health recently implemented a policy for patients receiving LTOT as defined as 3 months or longer. The data regarding this patient population was evaluated to assess UConn providers’ compliance to this policy. Over time, the number of patients identified as receiving LTOT from UConn prescribers has decreased. The goal of this study is to evaluate the reason why patients discontinued their prescription at UConn since the policy was introduced, as these patients may represent a group at high risk of opioid misuse or overdose.

Methods: As part of an ongoing quality improvement project, data on patients receiving chronic opioids (at least 3 prescriptions during a 12-week period) from UConn Health prescribers have been reviewed on a quarterly basis. We compared data sets from one data pull to the next to determine which patients had “fallen off” the list, with a total of 322 patients. Patients on suboxone or methadone for opioid use disorder were excluded from the study. For each patient, pain type, active opioid prescriptions, date of prescription discontinuation or last fill date, date of last appointment with the responsible prescriber, and reason for discontinuation were documented based on information from the patient chart and the Connecticut prescription monitoring database program.

Results: Data is still in review. Initial analysis reveals very few patients have discontinued their opioid prescriptions. The most common reasons for no longer being on the list fall into the following categories: “patient seeing pain management,” “receiving prescription from outside provider,” “opioids restarted,” “lost to follow-up,” or “left practice”. Patients who left the practice often did so due to provider-initiated discontinuation of their prescription. The least frequent reason for discontinuation has been “resolution of pain”.

Conclusions: As providers have become more aware of the harm of initiating opioid prescriptions, there remains a question of how to manage patients already on LTOT. Our study demonstrates that most of these patients have not transitioned to being opioid free, indicating a need for further research on the outcomes of chronic pain patients.

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Barriers to Healthcare Access for Families with Children with Chronic Illness and Disability in the Setting of Political Crisis in Nicaragua

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Background/Objectives: Beginning in April 2018, Nicaragua experienced political unrest that had many direct and indirect impacts on the healthcare system, including dismissal of government physicians, temporary closure of a public medical school, and increased military presence at government hospitals. Salud Para Todos Los Niños (SPTLN) is a longitudinal program developed collaboratively by FNE International and Richmond Global Health Alliance with the purpose of following children with chronic medical needs in León, Nicaragua. The purpose of this study was to determine both quantitatively and qualitatively the impact of the crisis on access to healthcare for the children and families followed by SPTLN.

Methods: This study was conducted during an SPTLN brigade in León, Nicaragua in September 2019, and consisted of a survey and interview with the caretaker of any child enrolled in SPTLN. Responses were compared to data obtained in 2017 prior to the crisis.

Results: A total of 30 interviews were completed. The perceived difficulty for the child to see a provider, wait times at the clinic, the types of transportation used to arrive at clinic, and the percentage of children who did not receive medical attention when the caregiver deemed it necessary were all not significantly different from prior to the crisis. Caregiver stress and depression scores were also not significantly different. The most highly rated barriers to healthcare access since the crisis were transportation (75%), money/cost (71%), distance to the clinic (68%) and clinic too full (68%). However, when given open ended prompts to discuss the impact of the crisis, only 37 – 50% of participants reported there was any impact on the child's daily life, health status overall, frequency of healthcare visits and mental health of the family. The most commonly reported examples included generalized stress about salaries and job availability (37%), concerns about the cost and availability of food, medications and transportation (27 - 30%), and the oversaturation of doctors and therapists with patients (10-20%).

Conclusions: The results of this study will be used to address the unique needs and concerns of the SPTLN participants as a result of the current environment in Nicaragua.

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The Effect of Early Cross Cultural Immersion Experiences on Intercultural Sensitivity, Empathy and Leadership within the Health Field

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Background: It is imperative that physicians in training acquire skills to effectively treat patients from a cultural and personal standpoint. Some of these skills include learning new languages, understanding different cultures, and developing one's cultural knowledge and awareness [1]. By acquiring these skills, physicians gain the ability to interact in a multicultural setting with individuals from all over the world [2]. This study aims to determine how early Cross Cultural Immersion Experiences can shape the way that these individuals will practice one day as medical professions and their effect on one's resiliency, cultural knowledge, awareness and skill.

Methods: Data was collected using validated surveys measuring responses to the following domains: cultural encounters, resiliency, attitude, intercultural skills, and global health competencies. The subjects were UConn School of Medicine and Dental Medicine students performing a cultural or lab-based research project. Qualified students were invited to complete the anonymous electronic survey pre and post summer. The study was repeated the following summer with new subjects.

Results: Pre-Summer responses: 19 completed surveys in the Cultural group, ten in the lab group. Post summer responses: four in the cultural group, and four in the lab group. Among these responses, the cultural group had higher pre and post summer averages when compared across each of the domains analyzed. According to the BRCA Resiliency validated scoring system, cultural pre and post summer participants were "medium" and "high" resilient copers, respectively. Pre and post lab participants were "low" and "medium" resilient copers, respectively [3] [4].

Conclusions: Although students performing cultural based research projects had higher scores among each sub-domain tested when compared to bench research participants, the groups cannot be compared due to the small sample size, selection bias, self-selection bias, and observer bias. In the future, this study would be more successful if participants are followed throughout the study by coding their responses. It is difficult to study change if one cannot keep track of it. In addition, it is imperative to get an adequate sample size. If the power of the study is not high enough, it is not possible to state whether the results are statistically significant, even if an effect took place.

Supported by: The UConn School of Medicine

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Actionability of A Newly Developed Online Nutrition Education Tool: “Small Changes in Diet, Big Changes in Health”

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Background and Objectives: Providing nutritional counseling to patients with the goal to help manage weight, diabetes, hypertension and heart disease can be difficult for providers, especially in a limited time setting. Health education has been shown to be a valuable intervention to improve health outcomes related to chronic diseases [1]. However, there are limited educational resources provided for patients to use outside of the clinic. The goal of this project was to create an online nutritional educational tool that can be introduced to patients in the clinic. In addition, be accessed by patients at any time to assist them in achieving their nutritional goals. The website created focuses on providing suggestions which help to alter patients’ most loved recipes into healthier versions. The suggestions are accompanied with reasoning as to why the suggestion may help better manage weight, diabetes, hypertension and heart disease.

Methods: To measure the website's ability to educate patients, a survey used to measure the website's actionability was available for patients and healthcare professionals to complete. Actionability was assessed by using modified questions obtained from a validated survey: "The Patient Educational Material Assessment Tool (PEMAT)" [4].

Results: The results of the survey indicate that the website scores highly in actionality, meaning the website can be easily viewed and its suggestions can be put into action by the reader.

Conclusions: Providing electronic patient resources for nutritional counseling that can be accessed outside of the office may have higher actionability scores than traditional handouts provided. Future studies focusing on comparing actionability of traditional paper resources to the electronic resource created is warranted.

Supported by: UConn School of Medicine

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Impact of Just-In-Time Emergency Department Simulation Training on Medical Student Procedural Performance

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Background: The progressive utilization of mannequin- and model-based simulation in medical education has greatly expanded opportunities for training future physicians. These modalities have special utility in the teaching of procedural skills where there is a risk of harm to patients.¹ Recent studies have combined simulation with a just-in-time (JIT) training approach in order to assess the efficacy of simulated practice of a procedure immediately prior to its performance in patient care.² In these studies, JIT training has demonstrated promising results in improving resident and faculty performance.^{3, 4}

Methods: This study was a prospective randomized trial that employed a self-directed simulation-based JIT training module in two emergency departments (ED). It aimed to assess whether JIT training improved procedural performance among medical students. The bespoke module incorporated videos, images, and written instructions that fourth-year medical students followed while performing a practice suturing procedure on a high-fidelity model. Students undertaking their emergency medicine rotation were randomized either to a treatment group that was asked to complete this module immediately prior to performing suturing or a control group of students that received no such intervention. During the completion of their first suture on a patient in the ED, students in both treatment and control groups had their suturing performance assessed by attending physicians using validated tools. All participants completed a self-assessment. A total of 18 students were evaluated, nine in the treatment group and nine in the control group.

Results: Students who were randomized to the module rated their suturing performance more highly (3.78/5.00 vs. 3.33/5.00, $p=0.28$), were observed to complete more steps on 21-point suturing checklist (19.22/21 vs. 16.22/21, $p=0.07$), and scored higher on a compound score of physician assessment of their technique (28.22/35 vs. 26.4/35, $p=0.47$). None of these differences were statistically significant. Attending physician assessment of the students overall suturing performance on a Likert scale did not differ between treatment and control group.

Conclusions: The implementation of a JIT suturing training module was not associated with an improvement in self-perception of suturing performance among medical students, nor was it associated with an improvement in technique as perceived by attending physicians.

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Pediatric Environmental Exposures in Connecticut Public Schools: A Case for Prevention

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Background

Public schools are the only settings, aside from prisons, to which we mandate attendance in the United States, oftentimes using district lines to determine which school system a child is assigned to. Unfortunately, many school facilities are severely outdated; in 2006, deferred remediations totaled \$322 billion,¹ placing both students and teachers at risk of environmental exposures and preventable illness.

While employees within school systems are protected by organizations such as the Occupational Safety and Health Administration (OSHA), no parallel governing body exists for children. Thus, our pediatric populations—already more vulnerable to the health consequences of environmental exposures because of body size and age-appropriate behaviors²—lack clear avenues for ensuring safe and healthy school environments.

Methods

In collaboration with the Connecticut Occupational Safety and Health Administration, a comprehensive review of all school-based inspections was conducted for 2013-2018, totaling 111 files.

Data was both qualitative and quantitative in nature, including testimony from employees and administration, anecdotal information relayed by Certified Health and Safety Officials, and testing results from samples collected on site visits.

Results

Files are diverse in the potential environmental exposures they address, with topics spanning indoor air quality, mold, chemical exposures, dust/poor cleaning, and a combination of these. When final results become available (currently 86/111 files reviewed), the following items will be reported: districts with higher incidence of complaints/consults, number of inspections with health code violations, schools cited for more than one offense, and districts with the greatest number of citations. Of the assigned citations, deficits in general housekeeping were most common, with inspectors noting conditions such as excessive dust or pest infestations. Although not every inspection is conducted because of a perceived health effect on the part of the employee, the most common symptoms, when listed, were respiratory issues and headache.

Conclusions

We can only infer the health consequences suffered by pediatric populations through the data taken from employee-filed consults and complaints in schools. More research is needed in order to determine which districts would benefit most from targeted approaches to mitigating environmental exposures.

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Regional Distributions and Temporal Changes of the Prevalence of Students with Autism Spectrum Disorder in Connecticut School Systems K-12

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Background: Connecticut does not have a comprehensive or coordinated service system for individuals with Autism Spectrum Disorder (ASD), and a better understanding of the population and prevalence of individuals with ASD in CT is needed in order to provide such services. The objective of this study is to determine regional distributions and temporal changes in the prevalence of ASD in school systems in CT.

Methods: An analysis of data collected from 169 CT school districts by Special Education Data Application and Collection on students grades K-12 between years 2011-2016 was carried out. Temporal changes in count and prevalence of students with ASD were determined at town, county, and state levels.

Results: CT had a 28.4% increase in prevalence of children with ASD in K-12 school systems from 2011-2016, with prevalence increasing from 1.2% (6,402 children) to 1.6% (8,222 children). All eight counties had increases in ASD count and prevalence. The smallest increase in ASD count was 58 in Tolland County, and the largest increase was 585 in Hartford County. The 109 school districts with >1000 students had a mean prevalence of 1.2% (s=0.4%) in the 2011-2012 school year, 1.3% (s=0.4%) in 2012-2013, 1.4% (s=0.4%) in 2013-2014, 1.5% (s=0.4%) in 2014-2015, and 1.6% (s=0.4%) in 2015-2016. From 2011-2016, mean increase in ASD count was 36.3% (s=74.9%) and mean increase in ASD prevalence was 44.6% (s=74.8%). Of these 109 school districts, 97 had an increase in ASD prevalence during this time period, four had no change, and eight had a decrease. Four districts had a >100% increase in ASD prevalence and four school districts had a ≥2% ASD prevalence throughout this period. The Hartford school district had the highest ASD count, an increase in ASD count from 229 to 392, and an increase in ASD prevalence from 1.0% to 1.9%.

Conclusions: From 2011-2016, the population of children with ASD in CT steadily grew, with prevalence of ASD increasing in all counties and most school districts. There were several school districts that experienced disproportionately high increases in ASD prevalence and several that consistently had the highest prevalence of ASD throughout the 2011-2016 period.

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Qualitative Assessment of Reasons for Living in Older Incarcerated Persons in Connecticut Prisons

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Background Objectives: Given longer sentences, minimum sentencing laws, and more arrests in later age, the population of older prisoners (age ≥50) has increased 300% since 1990. Older prisoners have the system's highest suicide rates. Yet, knowledge regarding risk and protective factors for suicide and suicide-related behaviors in this population is essentially non-existent. Among older persons living in the community, suicide prevention strategies are evolving towards promoting psychological resiliency and well-being rather than solely targeting risk factors. Consequently, in an effort to inform suicide risk reduction in older prisoners, we sought to improve understanding regarding reasons for living among older inmates, with a focus on inmates with and without current major depressive episode.

Methods: Participants included 250 sentenced inmates (age≥50) from across all 9 CT prisons with at least 36 months left on their sentence who were enrolled in the "Aging Inmates' Suicidal Ideation and Depression Study (Aging INSIDE). Clinical assessments of current or prior major depressive episodes were conducted during face-to-face interviews, and inmates were asked, "What are some of the reasons why you want to continue living?" Responses were transcribed verbatim and three investigators independently identified overarching themes. The investigators will meet to compare notes, resolve discrepancies, and finalize themes that describe the reasons for living among older inmates.

Results: Study participants were 95% male, had a mean age (SD) of 56.2(6.0) years, and were racially diverse (39% white; 40% black; 21% Hispanic/Other). Four preliminary emergent themes regarding reasons for living were family (53.6%), followed by future goals/plans (27.2%), belief system (13.2%), and lastly self-appreciation/perceived value (12.8%). Reasons for living will be compared between those with and without a major depressive disorder, and among other subgroups (e.g., race; those with life sentences).

Conclusion: Overarching themes regarding reasons for living among older inmates focus primarily on family aspects and future goals and plans. Results from this study can help guide to inform best practices for suicide risk reduction among older inmates, a rapidly growing yet often overlooked population.

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Implementation of the Measurement of Gait Speed into the Electronic Health Record System

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Background: Implementation science promotes integration of evidence-based interventions into healthcare practice. Our earlier work demonstrated feasibility of using radio-frequency identification device (RFID) technology to routinely assess gait speed at the UConn Geriatrics Clinic. To implement these findings into practice, we sought to incorporate a field for recording gait speed measurements into UConn Health's electronic health records (EHR) system, Epic. Furthermore, although the EHR is widely adopted in clinical practice, guidelines for implementing new data into the EHR are unavailable. Our secondary objective was to outline steps required to incorporate new items into the EHR, using the process of implementing a field for gait speed as an example.

Methods: We established clinical efficacy by comparing use of the RFID device to a gold-standard stopwatch recording in 85 geriatrics clinic patients age 62 to 99 years (mean age = 81.5 ± 7.8 years) and 65.9% female. We surveyed geriatricians regarding acceptability of using RFID technology to assess in-office gait speed and determined medical assistants' average time to measure gait speed. Identification of current and future workflow processes were developed in consultation with a UConn Medical Informatics Specialist. We identified potential stakeholders, determined allocation of resources, and developed educational materials for involved personnel. Detailed guidelines for conducting this process were developed.

Results: Clinical efficacy was established through the earlier feasibility study. In addition, 8 of 9 geriatricians reported high acceptability and 10 medical assistants spent an average of $84.7 (\pm 12.7)$ seconds measuring gait speed using the RFID. Current and future workflow processes included the medical assistant's role in measuring and documenting vitals in addition to gait speed. Potential stakeholders included geriatricians, surgeons, and physical therapists.

Conclusions: Implementing a new data field into the EHR is a complex and lengthy process that requires a multitude of steps. The field for recording gait speed can be used to monitor gait speed in geriatric patients and thereby guide clinical decisions made by healthcare providers. Guidelines that describe the steps to implement a new data field in Epic can be utilized by others interested in adding a data field to Epic.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Employing Risk Stratification to Decrease CT Pulmonary Angiogram Usage for Pulmonary Embolism Diagnosis

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Background/Objectives: Pulmonary embolism (PE) is a mechanical obstruction of the pulmonary vasculature that produces nonspecific signs and symptoms, such as chest pain and dyspnea. Physicians can use validated clinical decision algorithms (i.e. Wells criteria, PERC rule) and a D-dimer test to determine a patient's risk for PE (1). A retrospective chart review analyzing 247 charts from 7/1/15-6/30/16 in a single Emergency Department showed that 13.77% of CT pulmonary angiograms (CTPAs) were positive for PE, falling below the 15-18% positive rate seen in other studies (2-4). This study will reassess CTPA ordering over six months after provider education and implementation of a mandatory decision tool.

Methods: A mandatory decision tool was implemented in the electronic medical record when ordering a CTPA in the Emergency Department. Providers could choose from four options: pretest high clinical suspicion, Wells score >4, low risk patient with positive D-dimer, or other. Providers were educated on risk stratification protocols and their prior ordering rates. A retrospective chart review was then performed on patients who received a CTPA for suspected PE at a single Emergency Department from 4/1/19-10/1/19. Data was collected on the ordering physician, selection in the mandatory decision tool and CTPA result. Frequency tables were created to determine the percent of positive CTPAs and provider selections in the decision tool.

Results: 235 CTPAs were included in the analysis. 42 cases (17.87%) where CTPA was performed were positive for PE. 42.86% of the patients with PE had a CTPA ordered due to "pretest high clinical suspicion" and 38.1% were "low risk patients with positive D-dimer." The most common reasons for ordering a CTPA were "pretest high clinical suspicion" (43.4%) and "low risk patient with positive D-dimer" (32.3%).

Conclusion: This data shows that implementation of a mandatory decision tool in the electronic medical record and provider education led to improved usage of risk stratification by providers at this Emergency Department. This change resulted in an increase in the percent of positive CTPAs for PE from 13.77% to 17.87%. Future steps are to provide physicians feedback on their ordering rates and evaluate another six months of data.

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The Effects of Low-dose Aspirin on the Placental Pathology in Women with Preeclampsia

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Background/Objectives:

Preeclampsia is a syndrome characterized by the onset of hypertension and proteinuria after 20 weeks of gestation. Preeclampsia is among the most serious pregnancy complications. If left untreated, it can lead to severe maternal complications such as coagulopathy, renal and liver failure, stroke, and maternal death (1). A daily 81 milligram aspirin (ASA) is now recommended in the late first trimester for pregnant women with higher risk of developing preeclampsia (2). However, the exact mechanism of how low-dose aspirin prevents the development of preeclampsia is unclear. The purpose of this study is to investigate the effects of low-dose aspirin on the placental pathology in women at risk for preeclampsia. Our hypothesis is that aspirin is associated with gross and microscopic changes in placental pathology more consistent with normal placentas rather than preeclampsia placentas.

Methods:

We performed a retrospective cohort study by identifying all women admitted to UConn Health Labor and Delivery with 81 milligram ASA on their admission medication reconciliation from October 2015 to July 2017 and April 2018 to September 2019. Antepartum and delivery data were abstracted from the inpatient medical records. Placental pathology data were abstracted from final pathology reports. The placental pathology of these ASA patients were compared to a cohort of normal controls and preeclampsia controls, matching for maternal age, gestational age and similar timeframe for delivery. Inferential statistics were computed using t test, chi square and Fisher exact tests with SPSS.

Results:

A total of 109 ASA exposed, 74 preeclampsia control and 109 normal control placentas were identified for comparison. Maternal age ($p=0.422$) and gestational age ($p=0.127$) were similar across all groups. Preeclampsia patients showed significantly more accelerated villi maturation ($p<0.001$), smaller placental size for gestational age ($p<0.001$), more placental infarction ($p=.008$), and more focal lesion ($p=0.044$) compared to both ASA exposed and normal placentas. Persistent endovascular trophoblasts ($p=0.714$) and physiologic conversion of the decidual vessels ($p=0.720$) were similar across all groups.

Conclusions/Implications:

Understanding the pathogenesis as well as the prevention of preeclampsia is of significant importance in reducing the morbidity and mortality of pregnancy.

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2. American College of Obstetricians and Gynecologists. Hypertension in pregnancy. Washington, DC: American College of Obstetricians and Gynecologists; 2013. Accessed at www.acog.org/Resources_And_Publications/Task_Force_and_Work_Group_Reports/Hypertension_in_Pregnancy.

Title of Project: Incorporating Integrative Medicine (IM) into the UCONN MDelta Curriculum
Christina Yang¹, Agata Harabasz¹, Mary Guerrera¹, Zita Lazzarini¹

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Introduction: There is an increasing demand for and usage of IM - a patient-centered approach to care combining Allopathic Medicine with Complementary and Alternative Medicine (CAM) - among patients in the US.¹ Despite this, medical school education in the US has not risen to include IM as a component of their mandatory curricula.² As IM receives growing recognition for its value as an important dimension of preventative and therapeutic medicine, students would benefit from learning how to deliver some of the therapies in the office setting.³ The goal of this educational project was to create and implement a reproducible set of curricular materials on IM modalities and therapies in an effort to equip students with the knowledge to address such topics in a clinical setting.

Methods: Curricular material was created to be included in the DoCC D and E, VITALS and Home A courses in the MDelta Curriculum. Student feedback was elicited after each of the administered modules to change and enhance curricular material. A pre- and post- survey was administered assessing student knowledge, attitudes, skills and behaviors before and after the assigned interventions.

Results: 74.6% agree or strongly agree that IM is relevant to current medical practice today; 22.6% was neutral and 2.8% disagree or strongly disagree. However, only 10.5% of students agree or strongly agree that that our current curriculum provides adequate exposure to IM modalities; 45.6% was neutral and 43.9% disagree or strongly disagree. 65.5% would like to know more about IM modalities and how they can be used in patient care. Prior to intervention, students were asked to rate their knowledge and understanding of IM: 53% poor or no knowledge; 33.1% fair; 12.2% good; 1.7% very good or excellent.

Conclusion: Self-reported knowledge was poor for IM, although students recognize the importance of IM in patient care. We predicted that increased exposure to IM in the curriculum would increase awareness of IM topics, improve ability to communicate with patients in a clinical setting, create open and favorable attitudes towards IM and increase willingness to refer patients to IM practitioners.

Supported by: LEAPS into IM Program Grant

References:

1. Rakel D. Integrative Medicine, 4e. 2017. Philadelphia, PA: Elsevier Health Sciences.
2. Clarke TC, Black LI, Stussman BJ, Barnes PM, Nahin RL. [Trends in the use of complementary health approaches among adults: United States, 2002–2012](#). National health statistics reports; no 79. Hyattsville, MD: National Center for Health Statistics. 2015.
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Oral Presentations

TALKS

12:00 PM – 1:30PM Academic Rotunda

12:00: A Morphological Analysis of Nonunion of the Scapular Spine after Reverse Total Shoulder Arthroplasty

Simon D. Archambault, Lukas Muench, Elifho Obopilwe, Jonathon C. Levy, Augustus D. Mazzocca

12:15: Quantification of Proteoglycan 4 (PRG4) Suggests Elevated Levels in Sjögren's Syndrome Patient Saliva

Patricia Hare, Tannin A. Schmidt

12:30: Characterizing Expression of the *agr* Quorum Sensing Operon in *Staphylococcus epidermidis*

Caroline Golino, Peter Larson, Julia Oh

12:45: Community Engagement, Community Connectedness, and Social Cohesion in HIV/STI Testing Behavior Among MSM in China: A Factor Analysis

Anne Sung, Kevin Dieckhaus, Fan Yang, Joseph Tucker

1:00: Local and Systemic Effects of Endodontic Infection in a Mouse Model for Cherubism

Kathryn Forth, Yasuyuki Fujii, Nelson Monteiro, Homan Javahen, Ernst J. Reichenberger, I-Ping Chen

1:15: Combinations of Pharmacological Agents Reduce Intracellular α -Synuclein Levels

Isabel Nip, Kenneth Campellone

Poster Presentations

POSTERS

1:30PM – 2:45PM Odd #s; 2:45PM – 4:00PM Even #s Academic Rotunda

Dental Student Poster Presentations (#28 - #39)

Student:	Lauren Cardarelli	Poster #28 Rotunda
Mentor:	Dr. Aditya Tadinada	
Title:	Does Lack of Growth-space Prevent Root Completion in Impacted Maxillary canines?	
Student:	Albert Chen	Poster #29 Rotunda
Mentor:	Dr. Liisa Kuhn	
Title:	Testing the Efficacy of a Locally Delivered Senolytic in Preventing Alveolar Bone Loss	
Student:	Madison Cohen	Poster #30 Rotunda
Mentor:	Dr. Alan Lurie	
Title:	Diagnostic efficacy of 180° vs 360° CBCT Rotation Angle for Impacted 3rd Molar-adjacent Structure Relationships: An ex-vivo Study	
Student:	Tyler Guido	Poster #31 Rotunda
Mentor:	Dr. Dr. Frank Nichols	
Title:	The Uptake and Hydrolysis of L567 to L342 via Human Gingival Fibroblasts: Relationship to Chronic Periodontitis	
Student:	Bhavin Gupta	Poster #32 Rotunda
Mentor:	Dr. Carol Pilbeam	
Title:	The Role Of Calcium Calmodulin-Dependent Kinase Kinase (CAMKK) And Protein Kinase C (PKC) In The Parathyroid Hormone (PTH) Regulation Of Receptor Activator Of Nuclear Factor Kappa-B Ligand (RANKL)	
Student:	Jay Kim	Poster #33 Rotunda
Mentor:	Dr. Pamela G. Robey	
Title:	Characterizing Downstream Regulation Chondrogenic Differentiation of Induced Pluripotent Stem Cells through a SOX9 Reporter	
Student:	Alexandra McKenna	Poster #34 Rotunda
Mentor:	Dr. David Banach	
Title:	Antibiotic Prescribing Among Periodontists	
Student:	Mikayla Moynahan	Poster #35 Rotunda
Mentor:	Dr. Alix Deymier	
Title:	Dissolution of Biomimetic Carbonated Apatite Following Exposure to Varied Xerostomia Treatments	

Dental Student Poster Presentations

Student:	Courtney Regan	Poster #36 Rotunda
Mentor:	Dr. Mark Litt	
Title:	Parental Attitudes Toward Sedation And The Influence On A Child's Behavior In The Dental Operatory	
Student:	Rebecca Salustri	Poster #37 Rotunda
Mentor:	Dr. Effie Ioannidou	
Title:	The Effect of Repeated Non-Surgical Periodontal Intervention on Clinical Periodontal Parameters in End-State Renal Disease (ESRD) Patients Receiving Dialysis	
Student:	Robert Violette	Poster #38 Rotunda
Mentor:	David Banach	
Title:	Prophylactic Antibiotic Prescription Practices by Dentists in an Academic Outpatient Setting	
Student:	Matthew Wittstein	Poster #39 Rotunda
Mentor:	Dr. Carlos Degollado	
Title:	Provider Experiences: Implementing a Diabetes Screening into our Dental Exams	

Medical Student Poster Presentations (#1 - #12: Laboratory, #13 – #27: Public Health; #40 - #72: Clinical)

Student:	Adeola Adeyeye	#40 Lobby
Mentor:	Dr. Malini Persad	
Title:	Antenatal Hypertension Toolkit Utilization Improves Outcomes of Women at Risk for Hypertensive Disorders of Pregnancy	
Student:	Gabriella Ahle	#13 Rotunda
Mentor:	Dr. Kevin Dieckhaus	
Title:	Prevalence and Understanding of Sickle Cell Disease in Rorya District, Tanzania	
Student:	Maria Antony	#01 Rotunda
Mentor:	Dr. Tino Sanchez	
Title:	Quantitative High-Throughput Screening (qHTS) to Identify Activators of p97/VCP for IBMPFD	
Student:	Emily Arciero	#02 Rotunda
Mentor:	Dr. Patrick Murphy	
Title:	CRISPR Analysis to Elucidate Gene Regulatory Networks Underlying Endothelial Cell Activation in Response to Inflammatory Mediators.	
Student:	Divya Bana	#41 Lobby
Mentor:	Dr. Damion Grasso	
Title:	Interpersonal Violence and Clinical Vulnerability in Children	
Student:	Michele Beaudoin	#42 Lobby
Mentor:	Dr. Matthew Ledford	
Title:	Anticoagulant Reversal in Patients with Intracranial Hemorrhage on Direct Oral Anticoagulants at UConn Health	
Student:	George Bekheet	#03 Rotunda
Mentor:	Dr. Matt Howe	
Title:	Orexin Acts Through A Novel Thalamic Circuit To Mediate Nicotine Intake	
Student:	Lauren Benedetto	#43 Lobby
Mentor:	Dr. Roger Thrall, Dr. Kevin Felice	
Title:	Prevalence of Respiratory Symptoms and Abnormal Pulmonary Function Tests in Patients with Inclusion Body Myositis	
Student:	Kathryn Bentivegna	#14 Rotunda
Mentor:	Dr. Amy Hunter	
Title:	A State-wide Analysis of Pediatric Scald Burns by Tap Water, 2016-2018	

Medical Student Poster Presentations

Student:	Jessica Bertenshaw	#15 Rotunda
Mentor:	Dr. Kevin Dieckhaus	
Title:	Evaluating Differences in Prenatal Care Practices and Potential Gaps in Care between Nyabihuniko Health Center III and Clare Nsenga Clinic in Kisoro, Uganda.	
Student:	Sarah Black	#44 Lobby
Mentor:	Dr. Khuram Ghumman	
Title:	Standardization of Medication Interview Questions for Patients 65 or Older Who Take 5 or More Medications at East Granby Family Practice	
Student:	Marisa Boch	#16 Rotunda
Mentor:	Dr. Dana Scott	
Title:	Assessment of Contraceptive Needs Among Reproductive-Age Women in Guam	
Student:	Andrew Bompastore	#68 Lobby
Mentor:	Dr. Jeff Gross	
Title:	Applicability of Brain Function Monitoring During General Anesthesia	
Student:	Sandra Carpenter	#45 Lobby
Mentor:	Dr. Brendan Campbell, Katherine Herbst	
Title:	Using Decision Analysis to Inform Timing for Orchiopexy in Male Infants with Unilateral Cryptorchidism	
Student:	Crista Carty	#46 Lobby
Mentor:	Dr. Connie Tsao	
Title:	Cardiovascular Magnetic Resonance Strain Identifies Individuals with Cardiovascular Disease Despite Normal Ejection Fraction	
Student:	Brett Chen	#47 Lobby
Mentor:	Dr. Sabeena Arora	
Title:	Comparison of Mortality and Rehospitalization Rates between High Versus Low Dose Diuretics in Patients Hospitalized with Acute Decompensated Heart Failure: A Retrospective Observational Study	
Student:	Brock Chimileski	#48 Lobby
Mentor:	Dr. Sharon Smith	
Title:	Assessing The Feasibility Of A Novel Dietary Behaviors And Food Insecurity Screening Tool In The Adult Emergency Department	
Student:	Bethany Cucka	#04 Rotunda
Mentor:	Dr. Upendra Hegde	
Title:	A Comparison of Tumor Infiltrating Lymphocytes in Primary Cutaneous Melanoma between Young and Elderly Patients	

Medical Student Poster Presentations

Student:	Ryan Daigle	#05 Rotunda
Mentor:	Dr. Marc Hansen	
Title:	Synthetic Lethal Approaches to Osteosarcoma	
Student:	Matthew Dean	#49 Lobby
Mentor:	Dr. Kevin Dieckhaus	
Title:	Assessing Physical Activity Levels in Patients Diagnosed with Human Immunodeficiency Virus	
Student:	Audrey Defusco	#50 Lobby
Mentor:	Dr. Michael Payette	
Title:	Patient Characteristics Associated with Biologic Use in the Treatment of Hidradenitis Suppurativa: A Retrospective Chart Review	
Student:	Rose Emlein	#06 Rotunda
Mentor:	Dr. Henry Smilowitz	
Title:	Duel Effect of Endotoxin-Induced Inflammation on Radiation-Induced Dormancy of Intracranial Melanoma	
Student:	Lilah Fones	#51 Lobby
Mentor:	Dr. Lee Pace, Regina Kostyun	
Title:	Return to Sport Status, Patient Reported Outcome, and Re-injury Rates at a Minimum of 2-years Post-ACL Reconstruction in Adolescent Athletes	
Student:	Chase Foster-Spence	#07 Rotunda
Mentor:	Dr. Marja M. Hurley, Dr. Liping Xiao	
Title:	Understanding the Relationship Between Fgf2 Germline and Fgf2 Conditional Knockout in Osteoarthritis Development in Mice	
Student:	Alexander Gallaer	#17 Rotunda
Mentor:	Dr. Mark Clark	
Title:	Identifying Weaknesses in the Response to Moped-Related Injury on Block Island, RI	
Student:	Jacob Garrell	#52 Lobby
Mentor:	Dr. Kevin Dieckhaus	
Title:	Implementation and Validation of a HIV Risk Assessment Tool for a Dental Clinic in Hartford, CT	
Student:	Miranda Garrett	#18 Rotunda
Mentor:	Dr. Kevin Dieckhaus	
Title:	Factors Influencing Prevalence of Anemia in Children in Cusco and the Urubamba Valley, Peru	
Student:	Erin Hannon	1:45 A8
Mentor:	Dr. Naveed Hussain, Dr. Mariann Pappagallo	
Title:	Evaluating the Effectiveness of a Formal Care Path for Discharge of Infants with Bronchopulmonary Dysplasia (BPD) from the NICU: A Pilot Study	

Medical Student Poster Presentations

Student:	Jonathan Harrell	#53 Lobby
Mentor:	Dr. Julius Oni	
Title:	Patient Perceptions Of Financial Conflicts Of Interest In Orthopaedic Surgery	
Student:	Lauren Harrison	#19 Rotunda
Mentor:	Dr. Pramod Srivastava	
Title:	The Impact of Income Level on Ovarian Cancer Care and Outcomes in New York State	
Student:	Aaron Holmes	#54 Lobby
Mentor:	Dr. Upendra P. Hegde, Dr. Helen Swede	
Title:	Age and Cancer History as Risk Factors of Pre-Existing Autoimmunity in Patients Receiving Checkpoint Inhibitor Treatment for Metastatic Melanoma: A Large Retrospective Study	
Student:	Rebecca Hudon	2:30 A7
Mentor:	Dr. David Banach	
Title:	One-Year Readmission Rates of Connecticut Infants Diagnosed with Early Onset Neonatal Sepsis from 2007-2017	
Student:	Nathaniel Jenkins	#20 Rotunda
Mentor:	Dr. Helen Zhao Wu	
Title:	Identifying Doses of Physical Activity That Are Required for Optimized Glycemic Control	
Student:	Joshua Knopf	#55 Lobby
Mentor:	Dr. Hilary Onyiuke	
Title:	Onyiuke Grading Scale: A clinical classification system for the diagnosis and management of Bertolotti Syndrome	
Student:	Danielle Kriscenski	#08 Rotunda
Mentor:	Dr. Katherine Coyner	
Title:	Effects of Increasing Meniscal Extrusion on Tibiofemoral Contact Areas and the Efficacy of a Centralization Procedure	
Student:	William Lambert	#56 Lobby
Mentor:	Dr. John Pacella	
Title:	Bedside Ultrasound to Assess Acute Central Venous Pressure Change During Treatment of Decompensated Heart Failure	
Student:	Arthur Landry	#09 Rotunda
Mentor:	Dr. Augustus Mazzocca	
Title:	Intraoperative and in vitro Classification of Subacromial Bursal Tissue for Use in Biological Augmentation of Rotator Cuff Repair	

Medical Student Poster Presentations

Student:	Jiyae Lee	#69 Lobby
Mentor:	Dr. Jeff Gross	
Title:	Malignant Hyperthermia (MH)	
Student:	Klair Lubonja	#57 Lobby
Mentor:	Dr. Isaac Moss, Dr. Scott Mallozzi	
Title:	Understanding Return To Work Recommendations After Spinal Surgery	
Student:	Mohammed Malik	#58 Lobby
Mentor:	Dr. Brett Sloan, Dr. Reid Waldman	
Title:	2-Octyl Cyanoacrylate as Post-Operative Wound Care for Electrodesiccation and Curettage	
Student:	Mark McKenna	#10 Rotunda
Mentor:	Dr. Stephen Crocker	
Title:	HMGB1 as a Direct Inhibitor of Oligodendrocyte Maturation	
Student:	Caity Miller	#21 Rotunda
Mentor:	Dr. Kevin Dieckhaus	
Title:	Perceptions and Knowledge of Kangaroo Mother Care and Associated Health Benefits Among New Parents and Healthcare Workers in the Kisoro District of Uganda	
Student:	Margaret Mills	#59 Lobby
Mentor:	Dr. Katherine Kavanagh	
Title:	Female presenters at American Society of Pediatric Otolaryngology (ASPO): 2002 to 2017	
Student:	Connor Milone	#71 Lobby
Mentor:	Dr. Jeff Gross	
Title:	The Role of Neuromuscular Blocking Agents in Clinical Anesthesiology	
Student:	Ashleigh Moten	#22 Rotunda
Mentor:	Dr. Kevin Dieckhaus	
Title:	Contributions to the Management of Hypertension in Cusco, Peru: Impact of Knowledge and Healthcare Access on Hypertension Control	
Student:	Erica Nkwocha	2:00 A7
Mentor:	Dr. Yutaka Toya, Dr. Kevin Dieckhaus	
Title:	Effectiveness Of Type 2 Thyroplasty Vs. Botox Injections For Treatment Of Adductor Spasmodic Dysphonia	
Student:	Tijesunimi Oni	2:15 A8
Mentor:	Dr. Sophie Lanzkron	
Title:	Pregnancy-Related Venous Thromboembolism in African American Women with Sick Cell Trait	

Medical Student Poster Presentations

Student:	Purven Parikh	2:45 A8
Mentor:	Dr. Daniel Roberts	
Title:	Case Report: Augmented Visualization Surgical Microscope-assisted Microvascular Decompression for Hemifacial Spasm	
Student:	John Pflomm	#23 Rotunda
Mentor:	Dr. Kevin Dieckhaus	
Title:	Alcohol Consumption And Its Impact On Risk Behaviors And Self Perception/Stigma	
Student:	Srinath-Reddi Pingle	#61 Lobby
Mentor:	Dr. Agnes S. Kim	
Title:	Assessment Of Myocardial Deformation In Adult Patients With Type 2 Diabetes Mellitus	
Student:	Hannah Purtell	#24 Rotunda
Mentor:	Dr. Kevin Dieckhaus	
Title:	Baby Boxes In Uganda: A Pilot Intervention Targeting Infant Mortality	
Student:	Gwendolyn Schultz	1:30 A7
Mentor:	Dr. Harris Sultan	
Title:	Incidence of Ophthalmic Injuries in the National Basketball Association Resulting in Removal from Active Rosters Over a 21 Month Period	
Student:	Rebecca Schwartz	#63 Lobby
Mentor:	Dr. Andrew Winokur	
Title:	Effects of Acute Cannabis Administration on Psychomotor Function and Subjective Ratings of Intoxication	
Student:	Rhea Sindvani	#25 Rotunda
Mentor:	Dr. Lisa Barry	
Title:	Description of Patients with Substance Use Disorders Residing in Skilled Nursing Facilities in Central Connecticut	
Student:	Maria Slater	#11 Rotunda
Mentor:	Dr. Augustus D. Mazzocca	
Title:	Pressure Distribution of Ellitical and Spherical Heads in TSA	
Student:	Rati Srinivasan	#13 Rotunda
Mentor:	Dr. Kevin Dieckhaus	
Title:	Prevalence and Understanding of Sickle Cell Disease in Rorya District, Tanzania	
Student:	Jacqueline Steele	#64 Lobby
Mentor:	Dr. William Graf	
Title:	PLXNA3(Plexin A3) VariantsCause a Spectrum of Neurodevelopmental Disorders	

Medical Student Poster Presentations

Student: Victoria Stoj #26 Rotunda
Mentor:
Title: Evaluation of Social Media Presence of Dermatology Residency Programs

Student: Lisa Tamburini #12 Rotunda
Mentor: Dr. Augustus Mazzocca
Title: The Interaction Between Rotator Cuff Tendon and Subacromial Bursa in Culture

Student: Xinyue Tan #27 Rotunda
Mentor: Dr. Kevin Dieckhaus
Title: Survey of Mental Health Status in Vietnamese Men Who Have Sex with Men

Student: Xinyue Tan #70 Lobby
Mentor: Dr. Jeff Gross
Title: Literature Review on Impact of Preoperative Benzodiazepines on Postoperative Pain

Student: Ian Whittall #65 Lobby
Mentor: Dr. Alan Babigian
Title: Cutaneous Graft-Versus-Host Disease Treatment Comparison Retrospective Review

Student: Christian Yon #66 Lobby
Mentor: Dr. Richard J. Mackool Sr
Title: Influence of Posterior Staphyloma on Postoperative Astigmatism after Cataract Extraction in Highly Myopic Eyes

Student: Francine Zeng #67 Lobby
Mentor: Dr. Lauren Geaney, Dr. Anna Jorgensen
Title: The Characterization of the Bursal Cells of the Retrocalcaneal Bursa for Potential Augmentation in Achilles Tendon Surgery

Antenatal Hypertension Toolkit Utilization Improves Outcomes of Women at Risk for Hypertensive Disorders of Pregnancy

Adeola Adeyeye¹, Yanling Dong², Shridevi Persad³, Malini D. Persad²

¹University of Connecticut School of Medicine, UConn Health, Farmington, CT

²Renaissance School of Medicine at Stony Brook

³Weill Cornell Medicine

Background/Objectives: Hypertensive disorders of pregnancy are leading causes of maternal mortality worldwide.¹ According to the Center of Disease Control and Prevention (CDC), in the United States hypertensive disorders affect up to 8% of all pregnancies², and up to 10% globally³. It is defined by a new onset of hypertension or worsening hypertension after 20 weeks of gestation in combination with a new onset of proteinuria⁴. This study aims to determine if an antenatal hypertension toolkit improves management and outcomes of women at risk for hypertensive disorders of pregnancy.

Methods: A retrospective cohort study was performed on pregnant women presenting for routine care at Stony Brook University hospital from 2017-2018. Included in the study were women with a confirmed intrauterine pregnancy with risk factors for hypertensive disorders of pregnancy. Excluded were any cases of fetal loss, anomalies or terminations. Women in the high-risk group included those with a history of preeclampsia, multiple gestation, chronic hypertension, pregestational diabetes, renal disease, and/or autoimmune disease. Women in the moderate risk group included those who were nulliparous, obese, had a family history of preeclampsia, advanced maternal age, and/or had a pregnancy interval of more than 10 years. Per the tool kit, low dose aspirin administration was proposed for those with one risk factor in the high-risk group or 2+ risk factors in the moderate risk group. Adherence to the toolkit and incidence of hypertensive disorders of pregnancy was collected and compared. Chi square and fisher's exact tests were used as appropriate. A p value of <0.05 was deemed statistically significant.

Results: A total 94 women were included in the study. The incidence of hypertensive disorders of pregnancy in this cohort was 30.9%. Maternal characteristics associated with missed intervention opportunities included nulliparity, carrying a multiple gestation pregnancy and having pregestational diabetes. Adherence to the antenatal toolkit recommendations were associated with a significant reduction in the incidence of hypertensive disorders of pregnancy (20.0% vs. 43.2%, p=0.01).

Conclusion: Utilization of an antenatal hypertension toolkit not only aids with the identification and management of women at risk for hypertensive disorders of pregnancy but can also decrease the incidence of disease onset and recurrence.

Supported by: The University of Connecticut School of Medicine Summer Research Fellowship

References:

1. Berhan, Y., & Endeshaw, G. (2015). Maternal mortality predictors in women with hypertensive disorders of pregnancy: a retrospective cohort study. *Ethiopian journal of health sciences*, 25(1),89–98. doi:10.4314/ejhs.v25i1.12
2. Bibbins-Domingo, Kirsten, David C Grossman, Susan J Curry, Michael J Barry, Karina W Davidson, Chyke A Doubeni, John W Epling, Alex R Kemper, Alex H Krist, Ann E Kurth, C. Seth Landefeld, Carol M Mangione, William R Phillips, Maureen G Phipps, Michael Silverstein, Melissa A Simon, and Chien-Wen Tseng. "Screening for Preeclampsia: US Preventive Services Task Force Recommendation Statement." *JAMA* 317.16 (2017):1661-667. Web.
3. WHO recommendations for prevention and treatment of pre-eclampsia and eclampsia (PDF). 2011. ISBN 978-92-4-154833-5.
4. "High Blood Pressure during Pregnancy Fact Sheet." Centers of Disease Control and Prevention. 16 May 2018. Accessed on 4 Mar 2019. Available at: <https://www.cdc.gov/bloodpressure/pregnancy.htm>

Prevalence and Understanding of Sickle Cell Disease in Rorya District, Tanzania

Rati Srinivasan¹, Gabriella Ahle¹, Esther Kawira², Kevin Dieckhaus¹

¹University of Connecticut School of Medicine, UConn Health, Farmington, CT

²Shirati Hospital, Shirati, Rorya District, Tanzania

Background: Sickle cell disease (SCD) remains a significant cause of early childhood mortality in Sub-Saharan Africa, with Tanzania estimated to have the third highest number of SCD births/year. Currently, there is no universal SCD screening program in Tanzania. It has been predicted that the sickle gene is highly prevalent in the northwest region due to the proximity of Lake Victoria and high incidence of malaria in the area. This study aimed to determine the prevalence of SCD and sickle cell trait (SCT), as well as to evaluate understanding of SCD in Rorya District, a region of northwestern Tanzania.

Methods: This was a cross-sectional prevalence study. Children (47.9% male, 50.0% female, 2.1% sex not recorded, average age = 12.1 months, SD = 14.6) were recruited from health clinics and hospitals within Rorya District. Inclusion criteria consisted of children five years of age and younger living in Rorya District with parents who are proficient in Kiswahili and able to provide informed consent. Verbal informed consent was obtained from the participants' parent/guardian at the time of enrollment. Participants were screened using HemoTypeSC™, a rapid diagnostic test. In addition, sociodemographic data, family history, and a brief knowledge assessment of SCD were collected.

Results: A total of 1008 children were enrolled from June 2019 to August 2019. 2.7% (27/1008) had SCD, 25.6% had SCT (258/1008), and 71.2% (718/1008) were unaffected. 0.5% (5/1008) were excluded due to an invalid test result or recent blood transfusion. Furthermore, a limited understanding of SCD was demonstrated amongst parents/guardians. 60.8% reported having heard of SCD prior to enrollment. Only 28.1% agreed that SCD occurs more often in African people. The majority of responses were uncertain with regards to issues of genetic inheritance, clinical presentation, and disease management. Potential limitations include self-selection bias or recruitment bias from clinical settings.

Conclusions: The prevalence of SCD and SCT in Rorya District is one of the highest in the world, signifying a need for universal screening and improved education in the district. Data from this study will be used to inform clinical practices, justify the establishment of SCD-specific clinics, and highlight the need for improved screening efforts in this region.

Supported by: The UConn School of Medicine Summer Research Fellowship

References:

1. Peckham A, Eastburg L, Kawira E, et al. (2018). Point of Care Screening Study for Sickle Cell Disease in Newborns in Shirati, Tanzania. Unpublished manuscript.
2. Grosse SD, Odame I, Atrash HK, Amendah DD, Piel FB, Williams TN. Sickle cell disease in Africa: a neglected cause of early childhood mortality. *Am J Prev Med.* 2011;41(6 Suppl 4):S398–405.
3. Ambrose EE, Makani J, Chami N, et al. High birth prevalence of sickle cell disease in Northwestern Tanzania. *Pediatric blood & cancer.* 2018; 65(1):10.1002/pbc.26735. doi:10.1002/pbc.26735.
4. Steele C, Sinski A, Asibey J, et al. Point-of-care screening for sickle cell disease in low-resource settings: a multi-center evaluation of HemoTypeSC, a novel rapid test. *Am J Hematol.* 2019; 94(1):39-45. doi: 10.1002/ajh.25305.

Quantitative High-Throughput Screening (qHTS) to Identify Activators of p97/VCP

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Background: Valosin containing protein, also known as p97, has ATPase activity related to its function in proteosomal degradation of ubiquitinated proteins. P97 has been implicated in multiple neurodegenerative diseases involving aggregate-prone proteins. Diseases include Huntington's disease and Parkinson's disease, with aggregate-prone proteins such as polyQ and alpha-synuclein respectively. Though inhibitors of p97 have been brought to clinical trials for cancer therapy, there are no established activating compounds of the p97 system. It was hypothesized that activation of p97-associated proteosomal degradation could increase clearance of aggregates.

Methods: This project utilized automated high-throughput assay design to screen over 130,000 compounds to identify novel activators of p97/VCP. Robotic screening technology, assay materials, and exclusive compound libraries were utilized at the National Center for Advancing Translational Sciences (NCATS). The first stage of this project involved optimizing conditions of ATP substrate, recombinant p97 protein, and compound in a luciferase-dependent detection system for quantifying p97 ATPase activity. After optimizing the quantitative screening protocol, screening methodology included the primary screen of 132,000 compounds, follow-up sensitivity screening at an 11-point dose response, counter-screening to establish specificity of activators, and structure-activity relationship (SAR) analysis.

Results: This screening campaign identified 40 novel p97-specific activators, 16 of which were sensitive with IC50s below 150uM. Structure activity relationships of the p97 activators revealed four major structural clusters for further analogue and derivative screening.

Conclusions: Future directions include validating compound clusters of p97 activators against additional ATPase targets. Additionally, further experiments can be carried out to test lead activators in a cell-based toxicity and ER-stress in-vitro assay before introducing them to models of aggregate-prone polyQ or alpha-synuclein.

Supported by: National Institutes of Health Summer Internship Program

A Morphological Analysis of Nonunion of the Scapular Spine After Reverse Total Shoulder Arthroplasty

Simon D. Archambault¹, Lukas Muench², Elifho Obopilwe², Jonathon C. Levy³, Augustus D. Mazzocca^{1,2}

¹University of Connecticut School of Medicine, UConn Health, Farmington, CT

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Background: Scapular spine nonunion (SSNU) is an uncommon complication of reverse total shoulder arthroplasty (rTSA) and is reported in 3.1% to 10% of patients [1]. During an rTSA, the arm is lengthened to increase tension on the deltoids in order to bypass nonfunctional rotator cuff muscles [2,3]. There has been limited research correlating the increased deltoid tension with SSNU, and even less research correlating risk factors with the increased chance of SSNU. However, previous studies have demonstrated significant variances in the morphology the scapular spine [4]. It is hypothesized that differences in scapular spine morphology may be a risk factor for developing SSNU post rTSA. The purpose of this study is to examine if morphological differences in the scapular spine are correlated with SSNU post rTSA.

Methodology: A total of 120 preoperative shoulder 3D-CT scans were used to measure the scapular spines of patients who underwent rTSA. Of the total population, 90 patients had no complications and 30 had SSNU. 12 different measurements were taken on each 3D-CT scan (see figure 1). A 3:1 retrospective case control matched cohort analysis was conducted matching patients who has SSNU to patients without SSNU. Patients were matched by gender, age, and the length of the superior aspect of the scapular spine.

Results: The scapular spines of patients with SSNU were significantly different from scapular spines of healthy patients in both width of the medial-superior aspect (zone 3, $p < 0.05$), and medial projection angle ($p < 0.05$).

Conclusions: This study demonstrated differences in scapular spine morphology in patients who underwent SSNU. Patients who underwent scapular spine fractures had thinner scapular spines which were approximately perpendicular to the median border of the scapula. This information, can be used preoperatively to identify patients who may have scapular spine morphologies that place them at a higher risk of a SSNU complication.

Supported by: The UConn School of Medicine Summer Research Fellowship

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CRISPR Analysis to Elucidate Gene Regulatory Networks Underlying Endothelial Cell Activation in Response to Inflammatory Mediators.

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Background: Endothelial cells are a heterogeneous cell population that carry out a wide variety of functions including, but not limited to, mediating vascular permeability, leukocyte transmigration, hemostasis, and vasomotor tone (1). Their dysfunction, or activation, often marked by their expression of adhesion molecules, has been implicated in the pathogenesis of a wide variety of inflammatory disease states including atherosclerosis and aneurysm (2). Certain cytokines such as TNF-alpha and IL-1B, and the gram negative endotoxin, LPS, are known to induce endothelial activation largely via the pro-inflammatory transcription factor, NF-kB (3,4). Gene regulatory networks of these endothelial activation pathways are yet to be fully elucidated, therefore, CRISPR screens are a useful tool to identify key regulators. The identification and investigation of these genes are important initial steps in the development of therapeutic agents.

Methods: Murine aortic endothelial cells were expanded in culture and infected with CRISPR/Cas9 lentiviral libraries. In a prior screen, a genome-wide (Brie Library) CRISPR library at 4 guides per gene was utilized, and in the current screen, a targeted RNA-binding protein pool based off of in vivo informatics was used, at 5 guides per gene (5). Cells were plated and incubated with either TNF-alpha, IL-1B, or LPS and fluorescence activated cell sorting was carried out to separate the endothelial cell populations based off of high, medium, or low I-CAM and V-CAM expression. MaGeck analysis was carried out to uncover the positively and negatively selected sgRNAs in the high versus low responders (6).

Results: Based on these screens, a list of candidate genes involved in the endothelial response pathway was established. Genes of interest including Tdp43, Elavl1, and Ptbp1 have been identified and are currently being investigated via deletion studies in vitro and in vivo.

Conclusions: In response to the inflammatory mediators TNF-alpha, LPS, and IL-1B, a number of genes including key RNA binding proteins have been implicated in the endothelial response pathway and warrant further investigation via in vitro and in vivo applications.

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Interpersonal Violence and Clinical Vulnerability in Children

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Background/Objectives: Approximately 20% of children under the age of six experience interpersonal violence (IV) [1]. IV can take many forms, including conflict between parental figures or direct maltreatment and harsh parenting towards a child. Though children can show resilient outcomes in response to IV exposure, some may develop symptoms characterized by fear, distress, and disruptive behavior. Research suggests that dysfunction in the physiological stress response may serve an intermediate link between IV exposure and psychopathology, but it does not provide an explanation for the variation in responses [2]. This study will observe a sample of 360 4-6 year-old children with varying degrees of IV exposure to identify unique profiles of threat-reactivity towards determining if these profiles are indications of symptom manifestations in children over time.

Methods: Mother-child dyads participate in a laboratory visit at baseline and one year later. A comprehensive assessment measures threat reactivity, symptoms, IV exposure and maternal responsiveness during laboratory stress challenges. Parent-child interactions involve various tasks designed to observe child negative affect, anxiety, and disruptive behavior. The child is then assessed individually and monitored using electrophysiological methods that include ECG, EMG, and EEG while performing a computer task designed to assess differential autonomic and neural responses to facial expressions (i.e., angry, happy, neutral). Mothers undergo a comprehensive interview to assess children's exposure to interpersonal violence exposure and any associated emotional or behavioral symptoms.

Results: Data for this study is still being collected by way of continued visits and interviews with families. It is expected that children who are exposed to interpersonal violence will show increased stress reactivity as indicated by greater attention allocation and neural and autonomic responses to angry vs. happy or neutral faces, greater attention bias to threat-related stimuli, and elevated fear in response to stress challenges. It is further hypothesized that unique profiles of threat responding identified using person-centered clustering analyses will predict symptom patterns in children exposed to violence.

Conclusions: The outcome of this study will ultimately help parents recognize worrisome behavior and bring children to a professional for evaluations before symptoms manifest as future psychopathology.

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Anticoagulant Reversal in Patients with Intracranial Hemorrhage on Direct Oral Anticoagulants at UConn Health

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Background/Objectives: The development of Direct Oral Anticoagulants (DOACs) has provided many advancements for the prevention and management of thromboembolic disease over the last decade. Despite lowered overall risk, there is still a risk of hemorrhage while on these new therapies. In the event of a serious bleeding event, anticoagulant reversal is necessary. Exact recommendations for DOAC reversal were not available until recently. This study aimed to determine the level of adherence in the UConn Emergency Department to new recommendations in patients treated for intracranial hemorrhage while on DOAC therapy through a retrospective chart review.

Methods: Patients who were admitted into the UConn Health Emergency Department between May 2017 and May 2019 for an intracranial bleeding event while on Dabigatran, Rivaroxaban, Apixaban, Edoxaban or Warfarin were considered for the study. ICD diagnostic codes were cross referenced with patients who had received two consecutive head CTs or Kcentra (reversal agent) in an attempt to identify all eligible patient charts. Demographic data, protocol adherence, and patient outcome were recorded. Discharge location was used to represent patient outcome, and was recorded as discharge to previous location, higher level of care, or fatality. Reason for deviation of protocol was also recorded when applicable.

Results: 36 patient charts remained in the final analysis. 12 patients received care that followed protocol, 17 received care that differed. Patient outcomes did differ significantly ($p=0.035$) among groups whose care either followed or differed from protocol. Interestingly, patients whose care differed from protocol had better outcomes. The two groups did not differ significantly in terms of anticoagulant prescribed. Outcomes did not differ significantly by age, or gender.

Conclusions: Recent guidelines for anticoagulant reversal may not be associated with better outcomes. Limited sample size limits validity, but identifies area for further research.

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Orexin acts through a novel Thalamic Circuit to mediate Nicotine Intake

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Background/Objectives: Orexin neurons of the lateral hypothalamus have a major influence over appetitive behaviors and motivation.^[1] Orexin-A signaling via type 1 receptors in particular has been shown to modulate intake of cocaine, opiates, and nicotine.^[2] However, the discrete circuits, cell types, and behaviors this distributed neuropeptide system modulates to control drug intake are still being identified. We used behavioral pharmacology, behavioral agents, slice-electrophysiology, and fiber photometry to identify a novel circuitry whereby hypothalamic orexin neurons modulate the motivation to take nicotine by controlling neural circuitry in the dorsal thalamus.

Methods: Food-restricted mice were trained on a fixed-ratio schedule of reinforcement for food pellet delivery. After stable performance was met, they underwent surgery to implant a jugular catheter for IV nicotine administration and self-administration performance was assessed in several conditions including cohorts with one or two null alleles of the HCRTR1 gene and following administration of an orexin-1 receptor selective antagonist (SB-334867). Furthermore, some mice received GCAMP6M in ORX neurons of the lateral hypothalamus, allowing for calcium imaging during nicotine self-administration. Lastly, a challenge dose of nicotine was given to reporter mice (ORX1R-EYFP), to scan for novel thalamic orexin populations that may be responding directly to nicotine.

Results: Following administration of SB-33487, we observed a dose-dependent modulation of nicotine self-administration with effects specific to “higher effort” schedules (FR5TO20). Calcium imaging highlighted a significant increase in orexin population activity around active lever presses and this was more pronounced in the FR5TO20 cohort. Lastly, we identified area “X”, which was potentially activated in OX-1RKO mice following a challenge dose of nicotine as measured by Fos immunoreactivity.

Conclusion: Orexin neurons of the lateral hypothalamus project to an area of GABAergic neurons just lateral to the lateral habenula. These neurons modulate local dorsal thalamic excitability in the framework of effortful nicotine intake.

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Prevalence of Respiratory Symptoms and Abnormal Pulmonary Function Tests in Patients with Inclusion Body Myositis

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Background/Objectives: Inclusion body myositis (IBM) is a rare inflammatory myopathy that classically presents in adults with distal muscle weakness and atrophy. It has previously been believed that IBM has no effect on respiratory muscles and function;¹ however, several reports have documented respiratory muscle weakness and impairment in patients with IBM.² Specifically, they have shown that patients with IBM have reported respiratory symptoms of shortness of breath, daytime sleepiness and poor sleep quality, as well as abnormal pulmonary function tests (PFT).^{3,4} To our knowledge, no study has examined the relationship between subjective reporting of pulmonary symptoms and objective PFT results in patients with IBM.

Methods: A chart review of patients diagnosed with IBM who have been seen at the Hospital for Special Care (HSC) was performed. De-identified information on patient demographics (e.g., age, duration of disease, sex), social history (e.g., smoking history), disease characteristics (e.g., MRC scores, hand grip, dysphagia, facial weakness), respiratory symptoms (e.g., shortness of breath, headaches, daytime fatigue, sleep quality), and pulmonary function tests (e.g., FVC, FEV1, FEV1/FVC) within the past 5 years were collected.

Results: The majority of patients with IBM at HSC ($n = 60$) are male (63.3%) with an average age of 72.30 ($SD = 9.29$). Half (50.0%) of patients have a smoking history. At their last visit, 20.0% of patients reported shortness of breath, 10.3% of nocturnal headaches, 63.9% of daytime fatigue, and 12.9% of poor sleep quality. At the same visit, 52.5% of patients had an abnormal FVC ($M = 75.28\%$, $SD = 18.21\%$), 49.2% had an abnormal FEV1 ($M = 73.18\%$, $SD = 19.66\%$), and 23.0% had an abnormal FEV1/FVC ($M = 74.82\%$, $SD = 10.62\%$). Any PFT measure was abnormal in 69.4% of patients. No significant correlations between reported respiratory symptoms and PFTs were found.

Conclusions: Nearly 70% of patients with IBM have abnormal PFTs and this impaired pulmonary function is not associated with reports of subjective poor respiratory function. Thus, patients with IBM may have underlying pulmonary impairment without experiencing symptoms. This suggests that respiratory muscles may be impacted in patients with IBM and that PFTs should be obtained to assess pulmonary function.

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A State-wide Analysis of Pediatric Scald Burns by Tap Water, 2016-2018

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Background/Objectives: Unsafe tap water temperatures (>120° F) are a risk factor for pediatric scald burns in the home, which may disproportionately impact children from low-income, urban communities.^{1,2} We sought to estimate the frequency, incidence, and demographic characteristics of tap water burns and their association with housing characteristics in a state-representative sample.

Methods: We performed a secondary data analysis utilizing Emergency Department discharge records of children <18 years with an International Classification of Disease and Related Health Problems, Clinical Modification (ICD-10-CM) code for tap water burn (X11) and town-level housing data from the American Community Survey. Descriptive statistics were summarized for burn distribution by age, gender, race/ethnicity and town code. Unpaired student's t-test and spearman's correlation analysis were performed for comparative analyses.

Results: A total of 146 visits related to tap water burns were identified, representing an incidence rate of 2 visits per 10,000 ED visits. The majority of cases were male, non-Hispanic White children, of public insurance type, and from an urban CT town. The median age was 3 years, with 58% of cases <5 years. Towns with at least one tap water burn had a significantly higher average percentage of multi-family unit and renter housing as compared to towns with no tap water burns (p<0.0001).

Conclusions: Our results identified a significant number of tap water burns in children <18 years, particularly children <5 years. Additionally, this issue may disproportionately impact towns with higher rates of multi-family unit and renter housing. Primary prevention efforts targeting education or regulation of water temperatures may work to reduce burn incidence.

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Evaluating Differences in Prenatal Care Practices and Potential Gaps in Care between Nyabihuniko Health Center III and Clare Nsenga Clinic in Kisoro, Uganda.

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Background/Objectives: Nyabihuniko Health Center III and Clare Nsenga Clinic in Uganda offer prenatal services in a region where maternal and infant mortality rates are higher than many other countries [1,3,4]. The prenatal care services offered by Clare Nsenga Clinic have been evaluated in a previous study, which demonstrated certain aspects of prenatal care were lacking [2]. In this study, survey data was collected to understand the differences in prenatal care and corresponding health outcomes between the clinics. With this knowledge, it can be determined what aspects of care most affect health outcomes so that clinical practices can be adjusted in the future.

Methods: Patients who were available, willing, and who had given birth in the past year were interviewed at the Nyabihuniko Health Center III. With the help of the community translator, the survey tool was verbally administered after consent has been obtained to 146 participants.

Results: Overall, examination of the primary outcome indicates a widespread lack of adherence to WHO guidelines across antenatal care categories. For example, WHO recommends that women have at least 8 prenatal care visits during their pregnancy; in our sample, the average number of antenatal care visits during a given pregnancy was 3.9. The average antenatal composite score computed was 14.97 +/- 2.82. In comparison, the average antenatal score for survey data collected from Clare Nsenga Clinic was 13.55 +/- 3.01 [2].

Conclusions: The population surveyed overall does not meet the recommended guidelines and therefore is at risk for consequences of inadequate prenatal care such as miscarriages, birth defects, or other poor health outcomes. Interventions should be put in place in order to enhance adherence with the WHO guidelines in this community.

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Standardization of Medication Interview Questions for Patients 65 or Older Who Take 5 or More Medications at East Granby Family Practice

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According to the CDC, in 2013-2014, 42.2% of adults over the age of 65 reported taking 5 or more prescription drugs within the 30 days prior to being surveyed¹. Polypharmacy has also been associated with adverse outcomes in patients 65 or older, including increased fall risk², increased length of hospitalizations³, and increased risk for adverse drug reactions^{4,5}. Medication reviews are conducted routinely in many primary care practices, including East Granby Family Practice. However, there are no standardized questionnaires or methods aimed at de-prescribing in this population of which we are aware. With this small pilot study, we created a standardized questionnaire for medication review, and administered it to 20 patients 65 or older who were seen at East Granby Family Practice in July and August of 2019. We hoped to identify patients who may be at risk for polypharmacy and de-prescribe when appropriate. In the course of our study, we found that the average number of medications that had been prescribed to the patients prior to their visits was 9.25 (SD = 3.58), and this average was unchanged following their visits and administration of the questionnaire. Furthermore, 15% of patients reported experiencing side effects from their medication, and only 55% reported that they perceived improvements in their symptoms subjectively since starting any of their medications. Throughout the course of the study, only 2 visits resulted in the de-prescribing of one medication, and one additional visit resulted in a reduction in dose. 16% of patients had been prescribed at least one medication that is on Beer's List. While this questionnaire did not yield significant results in de-prescribing medications for the very small sample size of this study, the reported patient experience and high number of medications prescribed reinforces the need for further work in this area.

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Assessment of Contraceptive Needs Among Reproductive-Age Women in Guam

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Background/Objectives: Guam's elevated sexually transmitted infection rates suggest unmet Family Planning (FP) need among those experiencing barriers to reproductive healthcare. The Family Planning and Reproductive Health Project was funded to provide FP access for low-income, uninsured individuals. This study sought to assess contraception knowledge, perceptions, access, access barriers, and desirable characteristics to help direct funding towards Guam's Title X FP Clinic.

Methods: Data collection occurred over 7 weeks at Department of Public Health and Social Services facilities and STD/HIV Program outreaches. Participants (N=231) completed verbal (N=36) or written (N=195) questionnaires that assessed sociodemographic factors, reproductive/sexual health history, and familiarity, use, perceptions, and knowledge of 12 contraceptive methods. The questionnaire also assessed important contraceptive characteristics and barriers. Descriptive statistics were produced, and t-test was used to compare means and percentages between subgroups.

Results: Mean age was 28.1±9.3. Participants were predominantly Chamorro (34.2%) and Chuukese (25.5%), with the majority uninsured (31.1%) or publically insured (42.1%). Participants were most familiar with condoms (88.7%), oral contraceptive pills (OCP, 68.4%), injections (68.4%), and withdrawal (68.8%), which corresponds with their most used methods: condoms (56.3%), withdrawal (47.2%), and OCPs (34.2%). Among those reporting contraceptive objections (11.3%), side effect fears and lack of knowledge were common personal objections, and religious beliefs were common partner/family objections. Similarly, 92% of participants ranked safety, side effects, STI protection, and efficacy as "Very Important." Among those who identified barriers to contraceptive access (37.3%), cost (27.3%), lack of knowledge (15.7%), and insurance limitations (14.1%) were most prevalent. Lack of contraceptive knowledge was evident, with 48.0% overestimating condom effectiveness.

Conclusions: Women's familiarity and use of contraceptive methods is limited and is associated with misinformation and systemic access barriers. Combining health education with comprehensive access to safe, efficacious contraception through Guam's Title X FP Program is a promising strategy to address unmet FP need.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Does Lack of Growth-space Prevent Root Completion in Impacted Maxillary Canines?

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Objective: The objective of this retrospective study was to utilize CBCT technology in order to evaluate the degree of root development among unilaterally impacted canines based on the relationship between canine root development and the amount of space available between the root apex and maxillary sinus/nasal fossa floor.

Methods: A total of 54 de-identified CBCT scans with unilaterally impacted maxillary canines were retrospectively assessed from 35 female and 19 male participants. Inclusion criteria constituted patients over the age of 15 referred for orthodontic treatment with unilaterally impacted maxillary canines. The non-impacted canines on the contralateral side served as a control in this study. Exclusion criteria included patients who did not present only unilateral impacted maxillary canines, or patients who met inclusion criteria but did not meet the age requirement. Both the impacted and contralateral non-impacted sides were evaluated for key variables including but not limited to: degree of root development, proximity to closest anatomical barrier at root apex, proximity to surrounding teeth, type of impaction, and patient gender on Anatomage INVIVO - version 5 software.

Results: The results show that there was less space available at the root apex among maxillary impacted canines whose roots were not fully developed and this difference was statistically significant ($p = 0.021$). Canine length of impacted maxillary canine teeth were significantly shorter in length than their non-impacted counterparts ($p = 0.001$). A moderately strong negative correlation was found between the impacted canines showing closed root apex and decreased space availability between the root apex and floor of maxillary sinus/nasal fossa ($r = -0.42$). Raters were in significant agreement for variables measured in the data set.

Conclusion: Maxillary impacted canine root length and apex formation may be influenced by the lack of space between the tooth apex and either the floor of the maxillary sinus or nasal fossa floor.

Future Directions: Future directions may include a similar study with an expanded sample size and an older patient population. The inclusion criteria of ages 15 and over does not account for continued growth and development of the maxilla and its other structures – it only controls for the finalized growth and development of the impacted canines themselves. Incorporating patients with fully developed maxillary anatomy as well as finalized canine positioning would control for this limitation and the expanded sample size would increase statistical power.

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Using Decision Analysis to Inform Timing for Orchiopexy in Male Infants with Unilateral Cryptorchidism

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Background/Objectives: Cryptorchidism, or undescended testes, requires surgical correction. The American Urological Association recommends orchiopexy within 18 months of life to reduce the risk of infertility and malignancy¹. There is strong evidence that earlier surgery preserves fertility and decreases cancer rates in infants with bilateral cryptorchidism, but comparable benefit is less definitive for those with unilateral cryptorchidism. This study aims to use decision analysis to evaluate outcomes of different treatment options for male infants with unilateral cryptorchidism.

Methods: This project employed decision analysis to estimate the benefits and risks of performing orchiopexy before 18 months of age in patients with unilateral cryptorchidism. This work principally involved designing a decision tree methodology and logic framework. We used computer software to construct a decision model that addressed the question of interest. Then we performed a systematic literature review of PubMed to inform the probabilities and values assigned to each tree limb.

Results: Systematic literature review yielded a decision tree model with 50 limbs and 34 possible outcomes. Each limb of the tree will be assigned a probability based on clinical evidence. Ongoing work is being performed to assess and grade the evidence obtained from the systematic literature review. After grading, the results of relevant studies will be used to assign probabilities to each limb of the decision tree.

Conclusions: Using the decision tree framework, we can move forward with grading of the evidence from systematic literature review, assigning probabilities to each limb of the decision tree, and conducting sensitivity analyses of the model. The goal of this decision analysis is to better inform current clinical guidelines and provide insight about which outcome is most consistent with current evidence and the preferences of medical professionals and patients.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Cardiovascular Magnetic Resonance Strain Identifies Individuals with Cardiovascular Disease despite Normal Ejection Fraction

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Background/Objectives: Left ventricular ejection fraction (LVEF) is commonly used to identify patients with cardiovascular disease (CVD). However, this value does not quantify the changes in cardiac mechanics of the LV. Poor strain values have been implicated in worse prognoses for CVD [1]. Cardiac magnetic resonance imaging (CMR) provides cardiac strain values that may be used to identify early signs of CVD before clinical signs develop [2,3]. We sought to compare cardiac mechanics in patients with similar LVEFs with and without CVD using CMR measurements of LV strain.

Methods: Data from Second Generation Framingham Heart Study patients (n=1794) who had previously undergone CMR was analyzed using CVI 42 (Circle Cardiovascular Systems). LV epicardial and endocardial borders were outlined and used to determine cardiac longitudinal, circumferential, radial, and global strain values in patients with and without CVD. T tests were used to compare these two patient groups.

Results: There was no statistical difference between groups for LVEF, LV mass, age, BMI, sex, diabetes, hypertension, and smoking. Patients determined to have CVD had an average global longitudinal strain of $-16 \pm 4.2\%$, a global circumferential strain of $-16.4 \pm 4.5\%$, and global radial strain of $28 \pm 10.5\%$. Statistical significance was found between those with and without CVD for two-dimensional longitudinal, circumferential, and short axis radial strains with p values of 0.036, 0.006, and 0.009 respectively.

Conclusions: Cardiac magnetic resonance imaging successfully identified patients with changes in cardiac mechanic. This finding demonstrates the importance of assessing ventricular strain especially in patients with clinical cardiac symptoms without evidence of CVD or those found to have heart failure without reduced ejection fraction. Cardiac magnetic resonance imaging can better identify patients who have an increased risk for CVD development or MI than through LVEF values alone.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Testing the Efficacy of a Locally Delivered Senolytic in Preventing Alveolar Bone Loss

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Objectives: The loss of alveolar bone and periodontal ligament is a common issue among older patients and is thought to be caused by senescent cells. These cells are thought to develop a senescence associated secretory phenotype (SASP), which contains many pro-inflammatory cytokines that promote the resorption of bone through the osteoclasts [1]. A potential solution to this issue is by killing these cells with senolytic drugs (i.e. ABT-263) and preventing their influence on alveolar bone. It was hypothesized that ABT-263 can be locally delivered with a biomimetic calcium phosphate (bCaP) delivery system [2] that would mitigate the harmful side effects of the drug.

Methods: In order to establish the efficacy of bCaP as a local delivery system, four experiments were set up. The first measured the release of drug from the bCaP over time via spectrometry. The second was a cytotoxicity assay where CellTiter Blue kit was used to calculate the amount of viable cells after varying concentrations of the drug. The last two experiments measured the ability for the drug to prevent osteoclast formation under varying temperatures (heat stability) and from the bCaP. Statistical analysis such as ANOVA testing, t-testing and any post-hoc test was performed in GraphPad Prism.

Results: For the release experiment, minimal release of the drug was shown in media after 3 hours and onwards. For the cytotoxicity assay, the dose of ABT-263 that would kill around 50% of viable osteoblast and clast precursors is significantly over the dosage required to prevent osteoclastogenesis. For the heat stability assay, the temperature conditions that are required to adsorb the drug to the bCaP system do not affect activity. Finally, for the osteoclastogenesis assay, ABT-263 released from the bCaP disk was shown to be able to prevent osteoclastogenesis.

Conclusions: The minimal release from the system in media shows that the drug does not readily dissolve off the bCaP and is more locally delivered to the osteoclasts that attach onto the material. This is because there was still a blockage of osteoclastogenesis without any measured released drug into the surrounding media. This shows the potential of this bCaP delivery system to prevent osteoclast differentiation in a local and less harmful manner.

Future Directions: Although the results are promising, the next steps would involve testing this drug and delivery system in vivo starting with murine models.

Supported by: *The Partnership for Innovation and Education (P.I.E) Program.*

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Comparison of Mortality and Rehospitalization Rates between High versus Low Dose Diuretics in Patients Hospitalized with Acute Decompensated Heart Failure: A Retrospective Observational Study

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Background/Objectives: Acute decompensated heart failure (ADHF) causes approximately one million hospitalizations in the United States annually³. Hospital admission for this condition independently increases the risk that a patient will experience re-hospitalization or death within 30-days after discharge⁴. The predominant clinical manifestation of ADHF is pulmonary congestion¹, and intravenous loop diuretics are the cornerstone therapy for decongesting patients⁵. However, no widely-accepted guideline recommendations exist concerning how to optimize the dosing of these medications². The primary objective of this study was to assess the clinical outcomes of high-dose loop diuretic therapy in ADHF patients versus less aggressive dosing strategies.

Methods: In this retrospective observational study, 60 patients who were hospitalized for ADHF were randomly selected and then allocated into low-dose or high-dose diuretic treatment groups. High-dose therapy was determined to be an average daily loop diuretic dose of greater than 90mg of intravenous furosemide equivalents. Twenty study subjects qualified for the high-dose arm. A comparison of the two treatment groups was accomplished using the primary endpoints: 30-day re-hospitalization rate, 30-day mortality, and six-month mortality.

Results: There were no statistically significant results concerning the primary endpoints. The high-dose diuretic group exhibited a nonsignificant increased relative risk of 30-day re-hospitalization (RR: 2.0; p = 0.2503) and six-month mortality (RR: 8.0; p = 0.0575). The low-dose group had a relative 2.5% increased absolute risk of 30-day mortality (p = 0.6721).

Limitations: This study was limited by having very few subjects who received an average daily diuretic dose exceeding the 240mg of intravenous furosemide equivalents used as a threshold in other similar studies. Moreover, it is possible that subjects in the high-dose group were affected by a higher baseline disease severity that influenced their clinical outcomes.

Conclusion: High-dose loop diuretic therapy did not produce significant differences in 30-day re-hospitalization rate, 30-day mortality, or 6-month mortality versus less aggressive diuretic-dosing strategies.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Assessing the Feasibility of a Novel Dietary Behaviors and Food Insecurity Screening Tool in the Adult Emergency Department

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Background/Objectives: Obesity and poor dietary habits are a growing health burden in the United States, and access to adequate nutrition plays a significant role (1). Emergency departments (EDs) are often the primary point of healthcare contact for many patients who may have reduced food access or poor dietary habits (2, 3). Therefore, it may be valuable to screen for these concerns in the ED-setting (2, 3). The primary goal of this observational study was to assess the feasibility of implementing a dietary behaviors and food insecurity screening tool for patients presenting to the ED of University of Connecticut's John Dempsey Hospital.

Methods: Non-critically ill patients were approached and asked to complete an electronic survey consisting of a food insecurity screen and a food preferences assessment using a tablet. Demographic information and the participant's opinions of the survey were also collected. Feasibility measurements included percentage of approached patients who consented, average time for survey completion, and participant-perceived satisfaction with the encounter.

Results: 107 patients were approached with an enrollment success rate of 55%, and average time of completion was 26.5±15.5 minutes. Subjects were 42.4% male, 58.6% White, 20.7% Black, and 15.5% Hispanic, with a mean age of 44.4±15.4 years old. Of the patients who declined to participate, 76.6% cited not wanting to spend the time or being too tired or uncomfortable as the reason for their decline. Of the participants who did complete the survey, 92.9% enjoyed using a tablet, and 96.4% agreed that the survey was easy to complete. Furthermore, 24.5% of respondents screened positively for food insecurity.

Conclusions: These results indicate that this iteration of the screening tool may not be feasible for larger scale distribution, primarily due to time constraints. A shorter screening tool would be logistically easier to implement into the medical system, and would likely have greater patient participation, therefore increasing the likelihood of identifying patients in need. This insight has guided the development of a more succinct next step of the project focusing on food insecurity alone.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Diagnostic Efficacy of 180° vs 360° CBCT Rotation Angle for Impacted 3rd Molar-adjacent Structure Relationships: An ex-vivo Study

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Objectives: The objective of the ex-vivo study was to evaluate the accuracy of a low dose 180° CBCT acquisition protocol to localize impacted mandibular third molars and relation to proximal critical structures.

Methods: Twenty five fully or partially dentate human skulls with impacted, partially impacted, or erupted third molars in the mandible were used to provide 35 mandibular third molar sites. Wax was used to simulate soft tissue to simulate clinical conditions. The skulls were imaged using both the 180° and the conventional 360° scan. Two evaluators evaluated the scans twice with an interval of at least two weeks between each session.

Results: The comparison of various measurements of 35 molar relationships resulted in no significant statistical difference between the 180° and 360° protocols. A Cohen's Kappa statistical test was done to analyze inter-rater reliability for each measurement. The p-value for the unpaired sample t-test between the Cohen's kappa analysis was 0.892, showing that the two protocols were significantly similar in all the measurement categories.

Conclusions: This ex vivo CBCT study demonstrates that the 180° rotational CBCT acquisition is reliable in localizing impacted third molars, proximal critical structures and is comparable to the conventional 360° rotational acquisition.

Future Direction: The results from this study can be used in future studies to further examine the diagnostic efficacy of the low dose CBCT technique with other anatomic sites in order to work towards implementation of this protocol as the standard of care.

Supported by: The Partnership for Innovation and Education (PIE) program and UConn School of Dental Medicine.

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A Comparison of Tumor Infiltrating Lymphocytes in Primary Cutaneous Melanoma between Young and Elderly Patients

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Background/Objectives: Tumor infiltrating lymphocytes (TIL) serve as a valuable biomarker of response to immune checkpoint inhibitor therapy (ICIT) of metastatic melanoma (MM) but its value in primary cutaneous melanoma (PCM) is not clear. Studies indicate that dense lymphoid infiltrates at the site of PCM decrease sentinel lymph node metastases and improve recurrence-free and melanoma-specific survival^{1,2,3}. Recent reports of superior treatment outcomes in older melanoma patients compared to the young following ICIT have been linked to a favorable effector to regulatory T-cell ratio in the tumor microenvironment³. Since PCM in the elderly are associated with cumulative exposure to ultraviolet light fostering neo-epitope diversity, we examined if variability of TIL at the PCM site was influenced by age.

Methods: We retrospectively reviewed pathology reports of newly diagnosed PCM patients identified using a list of ICD codes of PCM in patients diagnosed at UCONN from the LCR system between 2011-2016. Patients were classified as young and elderly (<45 and >65 years of age respectively) and TIL density stratified as “absent”, “non-brisk,” and “brisk”¹.

Results: 70 patients were studied (12 young and 58 old) of which, 6 were classified as having “absent” (2 young, 4 old), 37 as “non-brisk” (6 young, 31 old), and 27 as “brisk” TIL (4 young, 23 old). A higher proportion of older patients compared to young harbored brisk TIL compared to non-brisk and absent (statistical significance p=0.0650).

Conclusions: Our results suggest that TIL at the PCM site are elevated in older subjects compared to young although it lacked statistical significance. Increasing the sample size will improve statistical power to our study and clarify value of TIL as a biomarker at the PCM site of response to ICIT in patients with MM.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Synthetic Lethal Approaches to Osteosarcoma

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Background/Objectives: Osteosarcoma is the most common primary tumor of bone¹. VPS4B, a member of the AAA ATPase family and part of the endosomal degradative pathway², is mutated in approximately 60% of osteosarcomas. Osteosarcoma tumors with mutations in VPS4B appear dependent on Ras signaling pathways. Targeting these Ras pathways may be specifically lethal for VPS4B^{mutant} tumors. This study seeks to test Ras signaling pathway inhibitors in osteosarcoma tumors that are VPS4B^{mutant} and VPS4B^{wt}.

Methods: Two cell lines were used: SAOS2 (VPS4B^{wt}) and OHS50 (VPS4B^{mutant}). Both lines were incubated for 14 days in media containing Sorafenib, Genistein, or both. These molecules block RAS/RAF/MEK/ERK or RAS/RAC/JNK/JUN signaling, respectively. Cell proliferation was measured using a WST-1 assay on days 0, 6, 10, and 14 of incubation.

Results: Growth of SAOS2 (VPS4B^{wt}) cells was not inhibited when incubated with either Sorafenib or Genistein, but not with both. Growth of OHS50 (VPS4B^{mutant}) cells was inhibited when incubated with either Sorafenib or Genistein alone. These findings indicate that in the absence of a VPS4B mutation, cells remain viable as long as one Ras signaling pathway remains. However, with a VPS4B mutation, the cells become addicted to Ras signaling and any RAS signaling reduction becomes lethal.

Conclusions: The differing patterns of drug sensitivity in osteosarcoma cell lines with a VPS4B mutation indicate Ras oncogene addiction. Targeting these pathways may result in increased susceptibility in mutant cells, while wild type cells are able to compensate.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Assessing Physical Activity Levels in Patients Diagnosed with Human Immunodeficiency Virus

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Background: Advancement in care of Human immunodeficiency virus (HIV) patients has prolonged survival, however HIV patients continue to be at an increased risk for chronic diseases such as cardiovascular disease¹. Regular physical activity (PA) has been demonstrated to be effective in treating the long-term complications of HIV². Despite these benefits a negative association exists between patients' HIV positive status and levels of PA³. This study aims to gauge the current levels of PA among HIV patients and to assess patient attributes impacting PA levels.

Methods: The study gathered information utilizing three different methods of data collection: a questionnaire assessing PA levels and patient attributes of interest, a health record review assessing HIV severity and cardiovascular risk markers, and a pedometer to obtain daily step counts. The study was conducted at the UConn Health Infectious Disease Clinic from June to August of 2019. Patients were enrolled via convenience sampling and 60 patients completed the questionnaire. Of these participants 59 also consented to a chart review and 36 wore pedometers to track daily step counts over a period of up to 4 weeks.

Results: Based on self-report measures 51.7% of the population met the Centers for Disease Control PA guidelines, below the national average of 53.3%⁴. The pedometer data demonstrated 63% of patients were considered to be "sedentary" based upon step count derived classifications⁵. Patient attributes significantly associated with decreased levels of PA included female gender, decreased functional status, history of hypertension, and increased body mass index ($p < 0.05$).

Conclusions: The results indicate low levels of PA among HIV patients at UConn Health and identify attributes that place patients at an increased risk of decreased PA. Future interventions should focus on promoting PA among HIV patients with special attention paid to educating patients on its role in reducing cardiovascular risk factors, and increasing opportunities for PA in women and those with impaired functional status.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Patient Characteristics Associated with Biologic Use in the Treatment of Hidradenitis Suppurativa: A Retrospective Chart Review

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Background/Objectives: The prevalence of clinically detected hidradenitis suppurativa (HS) is reported to be between 0.05-1%.^{1,2} Although certain demographic and lifestyle risk factors for disease development have been identified, it is unclear how patient factors might influence HS treatment decisions. This is particularly important given the currently available and pipeline therapies to treat HS as well as the heterogeneity in existing clinical guidelines.

Methods: In this retrospective chart review, we explored how demographic factors and past treatments might affect whether or not patients were treated with a biologic medication. 104 patients seen at UConn dermatology since May 1st, 2018 with an ICD 10 code indicating HS (L73.2) were randomly selected for inclusion. Demographic data and clinical treatment history for HS were recorded, as was severity data. Logistic regression analyses, a Cox proportional hazards model, and A Mann Whitney U test were used.

Results: We found that certain patient characteristics and medication usage patterns were more common in patients ultimately treated with biologic medications. Controlling for other measured factors, men were 3.29 times more likely to be prescribed adalimumab as compared to women (binomial logistic regression, $p = 0.018$) even though there was no difference in disease severity (Mann Whitney U Test, $p = 0.0549$). There was a tendency towards the use of steroid medications in patients who received biologics compared to those who did not. Use of topical antibiotics varied across both groups, but there was little variability in the use of oral antibiotics, indicating that oral antibiotics are commonly used as first line agents. Last, there was a greater than two-fold occurrence of surgical intervention in patients who ultimately required biologic therapy as compared to those who did not receive biologics.

Conclusions: Further exploration of these trends with larger datasets may lead to improvements in HS care in the future.

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Endotoxin-induced exit from Radiation Induced Tumor Dormancy

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A large fraction of cancer reoccurrences after the completion of successful surgery and radiation emerge years after completion of treatment. These recurrences have a serious impact on the long-term survival of patients, and understanding the cause would prove an essential step in prolonging dormancy. Therapeutic interventions that could lengthen or permanently establish dormancy would have beneficial effects on the long-term outcomes in patients. Recent research has implicated inflammation as playing an essential role in triggering reemergence from metastatic tumor dormancy, providing compelling evidence that elastase and MMP9 (proteases on neutrophil extracellular traps) remodel the extracellular matrix molecule laminin to create new epitopes. These new epitopes interact with dormant tumor cells to promote cell division and growth. Luciferase expressing B16 melanoma cells will be implanted in the brains of 40 C57BL/6 mice. From past experience it is known that mice that receive 250 B16 cells will die of tumor overgrowth after 14 days (median). After 7 days of growth, the tumors will be verified using IVIS. The mice will be sorted according to tumor size and two groups of 20 mice were created that contain approximately the same distribution of tumor sizes. All mice were irradiated on day 8 to induce tumor dormancy. One of these groups of 20 mice received no further treatment and the other group of 20 mice received a series of three IP injections of 1mg/kg LPS from E.coli strain 0111:B4 on days 3, 6, 9 after irradiation. Biweekly IVIS measurements of both groups were taken to monitor the growth of the tumors in both groups, demonstrating a bimodal distribution of cancer recurrence, with tumors growing more quickly and aggressively amongst the mice administered LPS, as well as a longer period of survival for those mice who survived the initial acceleration in tumor growth.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Return to Sport Status, Patient Reported Outcome, and Re-injury Rates at a Minimum of 2-years Post-ACL Reconstruction in Adolescent Athletes

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Background/Objectives: Significant variation exists in published rates of return to sport following anterior cruciate ligament reconstruction (ACLR) and limited studies focus on the adolescent population. Both functional outcomes and psychological response to injury are implicated in influencing return to sport. We sought to report mid-term return to primary sport, patient reported outcomes (PROs), and re-injury rate for adolescent's post-ACLR.

Methods: Chart review identified 13 to 18 years olds treated with primary ACLR December 2006-2016. Patients were contacted via phone at a minimum of two years post-ACLR to complete two PROs, the ACL Return to Sport after Injury (ACL-RSI) and International Knee Documentation Committee (IKDC) subjective form, and a return to sport questionnaire. Patients were divided into two groups (returned vs discontinued sport) for descriptive statistics and paired two-tail t-tests to determine differences between PROs.

Results: In total, 301 patients were contacted with 74 completing the survey (62.2% female, average surgical age 15.9±1.5 years, average follow-up age 19.9±2.0 years) at an average of 4.0±2.0 year's post-ACLR. Hamstring autograft ACLR was the most common reconstruction (n=65, 89.0%). Prior to injury, 82% self-identified as competitive athletes. The majority (n=54) returned to their primary sport post-ACLR and maintain the same (n=29, 53.7%) or higher (n=20, 37.0%) competition level. There were 20 patients (27.0%) who discontinued their primary sport, reporting the principle reason as changes in team (n=6, 30%), poor knee function (n=5, 25%), or fear of re-injury (n=4, 20%). Both IKDC and ACL-RSI scores were statistically lower in patients who discontinued relative to those that returned (IKDC: Returned – 90.3±12.3, Discontinued – 81.9±14.8, p = 0.030; ACL-RSI: Returned – 81.6±20.4, Discontinued – 52.7±26.7, p < 0.001). There were 18 patients who reported suffering another ACL injury for a re-injury rate of 24.3%.

Conclusions: At a minimum of two years post-ACLR, 73% of adolescent patients successfully returned to their primary pre-injury sport. Both knee function and psychological responses to injury are important in determining an adolescent athlete's return to sport.

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Local and Systemic Effects of Endodontic Infection in a Mouse Model for Cherubism

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Objective: The focal infection theory stated that dental infection can disseminate systemically. Though rejected, it remains a public concern due to insufficient scientific evidence. Our long-term goal is to study whether endodontic infection impacts healthy and medically compromised patients differently. Here, we examined the local and systemic effects of endodontic infection on wild type mice and mice with cherubism (CBM), an autoinflammatory disorder. We hypothesized that infection is limited to local in wild type, whereas it triggers systemic inflammation in mutant mice.

Methods: Apical periodontitis was induced through pulp exposure of right first molars of 6- week-old wild type and CBM knock-in (KI) *Sh3bp2*^{KI/KI} male and female mice. Left mandibles served as controls. Outcomes were assessed 3, 7 and 14 days after pulp exposure. Local effects were analyzed by immunohistochemistry (IHC) to detect numbers of neutrophils, macrophages, and osteoclasts and by qPCR to quantify mRNA levels of *IL-1 α* , *IL-1 β* , *IL-6*, and *TNF α* . Changes in immune cell numbers or cytokine levels in left mandibles were considered via systemic effects of endodontic infection.

Results: We showed that **1)** rapid (as early as at day 3) and increased neutrophil influx; **2)** increased osteoclast numbers and bone resorption; **3)** increased macrophage numbers in *Sh3bp2*^{KI/KI} mice 14 days after pulp exposure, compared to their *Sh3bp2*^{+/+} littermates. We also observed increased levels of *IL-6*, *IL-1 β* and *TNF α* of both *Sh3bp2*^{+/+} and *Sh3bp2*^{KI/KI} mice 14 days after pulp exposure. More importantly, these cytokine levels were increased in left mandibles, where pulp was not exposed, in *Sh3bp2*^{KI/KI} mice, but not *Sh3bp2*^{+/+} mice.

Conclusions: There are higher numbers of neutrophils, macrophages, and osteoclasts in *Sh3bp2*^{KI/KI} mice than *Sh3bp2*^{+/+} mice. Increased levels of *IL-1 β* and *IL-6* in apical periodontitis is locally restricted in *Sh3bp2*^{+/+} mice, while endodontic infection may have systemic effects in upregulating inflammatory cytokines in *Sh3bp2*^{KI/KI} mice. Apical periodontitis is exacerbated by increased host inflammatory response in *Sh3bp2*^{KI/KI} mice.

Future Directions: Our results will have positive impacts on clinical care of CBM patients. It will lay the groundwork for future studies on other diseases and potentially influence guidelines for endodontic treatment of medically compromised patients.

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Understanding the Relationship Between Fgf2 Germline and Fgf2 Conditional Knockout in Osteoarthritis Development in Mice

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Background/Objectives: Osteoarthritis (OA) is the most common form of degenerative joint disease and a leading chronic disease worldwide with limited treatment. Fibroblast growth factor 2 (FGF2) gene is important for bone remodeling and it encodes both high molecular weight (HMW) and low molecular weight (LMW) isoforms that have different effects. Germline ablation of the Fgf2 gene has been shown to induce OA phenotype. Ablating LMW FGF2 has led to murine OA with increasing levels of FGF23 in the articular cartilage. Ablating HMW FGF2 did not lead to OA characteristics but presented similarly to the WT phenotype, thereby concluding that the LMW isoform has a protective role against OA. These differences suggest that FGF2 has both anabolic and catabolic effects in OA. Understanding role of FGF2 has the potential to lead to other therapeutic treatments for OA. Our goal is to compare the phenotypic changes of OA in the knees of 8 months old male wild type (WT) mice, and mice in which all isoforms of FGF2 have been germline knockout (Fgf2^{ALLKO}), versus mice in which the Fgf2 gene has been conditionally knocked out in articular cartilage the (Fgf2^{ckO}).

Methods: Generation of Fgf2 conditional knockout mice by UCONN Health Center for Mouse Genome Modification (CMGM). Generation of articular cartilage chondrocyte specific Fgf2 knockout by crossing Fgf2 floxed mice with Type 2 Collagen Cre mice to obtain experimental mice: -Col2Cre(+/+)/Fgf2(fl/fl) = Control Mice. Col2Cre(Tg/+)/Fgf2(fl/fl)= cKO. All experiments using mice were approved by UCONN Health Animal Care and Use Committee. Body weight, BMD, and x-ray of knee taken at 4 months of age before tamoxifen injection. Mice were Tamoxifen (TM) injected at 4 months (100ug/g body weight ip), for 5 consecutive days. Body weight, BMD, x-ray knees, were obtained at 1, 2, and 4 months post TM injection prior to sacrifice. Mice were then sacrificed at 8 months of age for further analysis. Imaging of the joint architecture was performed using microcomputed tomography (microCT). Histological analysis of the knee joint, specifically the articular cartilage was stained for proteoglycan by Safranin-O and matrix degrading enzymes MMP-13 and ADAMTS-5. Alkaline phosphatase (AP) staining was applied. Histological images were captured using Nikon TS100 microscope interfaced with SPOT software to assess destruction of potential the cartilage and subchondral bone.

Results: Safranin-O staining revealed loss of articular cartilage as shown by reduced proteoglycan in the articular cartilage of 8-months-old cKO knee compared with control. Increased degradative enzyme MMP13 was observed in cKO compared with control. Degradative enzyme ADAMTS-5 was similar between cKO and control. Increased alkaline phosphatase consistent with increased hypertrophic chondrocytes was observed in the cKO compared to the control.

Conclusions: We conclude that specific loss of FGF2 in chondrocytes results in OA in mice similar to that observed in germline Fgf2^{ALLKO}, consistent with a specific role for FGF2 in protecting against OA in mice.

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Identifying Weaknesses in the Response to Moped-Related Injury on Block Island, RI

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Background/objectives: Moped crashes result in 1.2 million deaths and 50 million injuries annually¹, and they are becoming more commonplace every year^{2,3,4}. The head and lower extremities have been shown to be especially vulnerable in these crashes^{3,5,6,7,8}. Despite this, there is often little to no regulation on mopeds, and individuals without any formal training or education regarding their use are often able to rent or purchase them. On Block Island, RI, there is an annual surge in moped usage by tourists which is been a major concern of island medical providers. This study aims to classify moped crashes on Block Island, RI to elucidate potential areas of intervention.

Methods: A 2 year prospective study was conducted on individuals involved in moped crashes that resulted in the activation of the emergency medical system. A standardized form assessing crash circumstances, injuries, and presence of established risk factors was filled out by the patient's primary medical provider following injury stabilization or transport.

Results: 69 total crashes fit outlined criteria, with 56 suitable for analysis. Accidents were most likely to occur in the presence of sand, dirt road, or alcohol ingestion, while most likely injuries were road rash, lower extremity injury, and laceration. Increased incidence of lower extremity injury correlated with open toed shoes.

Conclusions: Many areas for intervention exist, including alcohol use of drivers, presence on dirt roads, and wearing of protective clothing. Promoting closed toed footwear while operating a moped seems to be an especially promising avenue for reducing both injury quantity and severity.

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Implementation and Validation of a HIV Risk Assessment Tool for a Dental Clinic in Hartford, CT

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Background/Objectives: Despite aggressive prevention and antiretroviral treatment (ART) strategies have helped reduce the incidence / mortality of HIV, it remains an important cause of morbidity in the US.¹⁻⁴ It is estimated that 162,500 individuals of the 1.1 million individuals older than the age of 13 in the US have not been formally diagnosed⁵. We intended to implement a short-screening tool to assess risk according to CDC defined domains and validate it using a longer survey for a Dental Clinic in Hartford, CT.

Methods: Dental clinic patients were recruited during the summer of 2019. Participants (n=91) filled out a short-survey consisting of demographic and risk-assessing questions during their visit and were offered a longer survey to complete for enrollment into the study. The Domains were the following, 1) IV drug users, 2) Heterosexual patients with an HIV infected partner, 3) Men who have sex with men (MSM), and 4) Patients with multiple sexual partners. The patients filled out the longer survey with a research assistant and asked follow up questions to evaluate their risk. Chi-square was used to compare the two surveys and descriptive statistics were evaluated in each of the different domains of risk.

Results: We were not able to reject the null hypothesis that the short and long surveys were different in identifying number of patients with risk vs no risk ($P > .05$ (.2975)). The sensitivity, specificity, positive and negative-predictive values varied per CDC domain. Domain 1 Sensitivity = 100%, Specificity = 98.9%, PPV = 50% and NPV = 100%, Domain 2 Sensitivity = 0%, Specificity = 98.7%, PPV = 0% and NPV = 96.2%, Domain 3 Sensitivity = 100%, Specificity = 100%, PPV = 100% and NPV = 100%, Domain 4 Sensitivity = 74.3%, Specificity = 87.5%, PPV = 78.8% and NPV = 84.5%.

Conclusions: The short and long surveys predicted risk at similar rates; however, there were discrepancies between the surveys with false positives and false negatives. The question wording, health literacy of the population, and patient comfort to disclose sensitive information all were factors. The short tool may be easier to implement in a clinical practice at the expense of higher rates of false-positives, which in the case of an HIV screening tool with limited harm associated with testing, may serve a clinical utility.

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Factors Influencing Prevalence of Anemia in Children in Cusco and the Urubamba Valley, Peru

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Background/Objectives: Anemia is a major problem in the pediatric population in Peru affecting 43.6% of children between the ages of 6 and 36 months. This is believed to be largely due to malnutrition. As a result, the Peruvian Ministry of Health has developed a plan to treat and prevent anemia through increased iron supplementation, nutritional counseling, and increased availability of iron rich foods [1]. This research aimed to elucidate the causes of anemia in this region by investigating dietary habits, access to iron supplementation, access to healthcare, and exposure to hookworms.

Methods: Blood samples were obtained from children ages 6 months to 5 years in Cusco and the Urubamba Valley of Peru and evaluated for hemoglobin concentration. Parents completed a questionnaire addressing dietary intake of various food groups, receipt of iron supplementation, exposure to hookworms through lack of daily use of shoes, distance from their home to the nearest healthcare facility, and number of healthcare exams in the past year.

Results: Mean age was 37 ± 19 (6-71) months. Mean hemoglobin concentration was 10.7 ± 1.5 (7.1-15.2) g/dL. Hemoglobin concentration and level of anemia as defined by WHO [2] were not significantly associated with iron supplementation, intake of grains, fruits, vegetables, or meat and beans, healthcare exams in the past year, or distance from home to the nearest healthcare facility. Individuals who did not wear shoes daily had significantly lower hemoglobin concentrations than daily shoe wearers.

Conclusions: Despite the significant effect of wearing shoes, the validity of this finding is questionable due to a small number of non-shoe wearers. The findings of this research do not support the previous belief that poor nutrition is the primary cause of anemia in children in this region of Peru. However, these findings highlight the importance of further research into the prevalence and effects of hookworm in the region.

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Characterizing Expression of the *agr* Quorum Sensing Operon in *Staphylococcus epidermidis*

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Background/Objectives: As microbiome research illuminates the role of the microbiome on human health, so too does it reveal areas in which bioengineering may play a role in promoting healthy microbiomes and inhibiting pathogenic ones. The skin microbiome is home to more than a thousand organisms, some of which may prove to be useful chassis for expressing bioengineered circuits that may function as biosensors, administer biologics, or inhibit infection^[1]. Many bacterial species contain quorum signaling pathways meant to recognize individuals of the same species. One such pathway, the *agr* pathway, in *staphylococci* is one promising mechanism for engineering biological recognition of pathogenic *Staphylococcus aureus* and triggering the release of antimicrobial peptides to prevent infection^[2, 3].

Methods: In order to establish the *agr* pathway as a mechanism to detect the presence of *S. aureus* and initiate the release of an antimicrobial, we further characterized the pathway when expressed in a commensal strain of *S. epidermidis*. By engineering a reporter gene system for the *agr* pathway, we were able to alter individual genetic elements to identify sources of leak.

Results: The levels of expression of the reporter gene inserted into the *agr* pathway in the absence of the inducer molecule indicate that there is significant leakiness in the receptor or downstream signaling molecule of this pathway, rather than baseline levels of expression due to promoter leakiness.

Conclusions: Although the *agr* pathway may be a useful biosensor and tool for delivering antimicrobial molecules in the presence of pathogenic *S. aureus*, there is significant work to be done to decrease the levels of uninduced expression.

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The Uptake and Hydrolysis of L567 to L342 via Human Gingival Fibroblasts: Relationship to Chronic Periodontitis

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Objective: Chronic periodontitis tissues from humans contain elevated levels of the bacterial glycine lipid, L342, which is believed to be derived from precursor glycine (L567) and serine (L654) lipids produced by *Porphyromonas gingivalis*. This study evaluated whether human gingival fibroblasts take up and hydrolyze L567 to L342, providing an explanation by why L342 could be elevated in periodontitis-afflicted tissues. The goal of this study was to determine the time course of L567 uptake and hydrolysis to L342 (quantified by GC-MS and LC-MS) in human gingival fibroblasts (HGF).

Methods: Fibroblast cells were cultured and treated with purified preparations of either L567 or L654, with cell and media samples taken at time various time points. Chloroform extractions were evaluated for the relative levels L567 and L342 utilizing LC-ESI-MRM and GC-MS respectively. The levels of IL-6 were determined in media samples from fibroblasts treated with either lipid class and with or without IL-1 α .

Results: Fibroblasts treated with L567 and L654 both show a maximum uptake of L654 and L567 at 24 hours with uptake declining at 48 and 72 hour time points. Cells treated with either L567 or L654 both showed linear hydrolysis to L342 over a 72 hour time course. Cells treated with and without IL-1 α at 72 hours showed a significant increase in lipid ion abundance for L342. Fibroblasts treated with L654 and IL-1 α showed significantly increased secretion of IL-6 compared to cells treated with either L342, L567, L654 alone or L567 with IL-1 α or L342 with IL-1 α .

Conclusions: These results demonstrate that fibroblasts rapidly take up L654 and L567 in a 24 hour period, with lipid levels decreasing at 48 and 72 hour time points. Hydrolysis of L567 and L654 to L342 was also observed and followed linear kinetics. Cells exposed to L654 and IL-1 α showed a significantly increased IL-6 release compared to fibroblasts treated with IL-1 α and either L567 or L342. These results suggest a possible potentiation of L654-mediated release of the proinflammatory cytokine IL-6 by human gingival fibroblasts.

Future Directions: One question we would like to evaluate is the effect of bacterial lipids together with other pro-inflammatory stimulators such as LPS, to determine possible synergistic relationships between these lipids and other microbial pro-inflammatory factors that may contribute to chronic periodontitis.

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The Role Of Calcium Calmodulin-Dependent Kinase Kinase (CAMKK) And Protein Kinase C (PKC) In The Parathyroid Hormone (PTH) Regulation Of Receptor Activator Of Nuclear Factor Kappa-B Ligand (RANKL)

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Objective: Parathyroid hormone (PTH) is secreted from the parathyroid gland and is a critical regulator of calcium and bone homeostasis. PTH acts on osteoblast lineage cells to increase both bone formation and bone resorption. PTH increases bone resorption by increasing receptor activator of nuclear factor kappa-B ligand (RANKL) expression on the surface of osteoblasts and decreasing osteoprotegerin (OPG). For this study, there were two specific aims: first, to determine the downstream pathways of CAMKK; second, to determine the involvement of CREB in both Gas dependent pathway involving PKA and Gaq dependent pathway involving PKC.

Methods: Primary osteoblasts (POBs) were isolated from neonatal mouse calvaria and then cultured in differentiation media for five days. POBs were then treated with calcium/calmodulin-dependent kinase kinase (CaMKK) inhibitors or inhibitors for calcineurin activation, Cyclosporine and FK506 for 45 minutes before induction with PTH for 2 hours. Additional inhibitors that were used during this experiment include H89 which is a Protein Kinase A inhibitor and GF109203X, which is a Protein Kinase C inhibitor. NFAT nuclear translocation and CREB phosphorylation were studied by treating POBs with PTH and then visualized with western blot.

Results: *Ramp3* mRNA expression was used as a marker for the involvement of cAMP/PKA pathway. Addition of cAMP/PKA inhibitor (H-89) blocked the PTH stimulation of *Ramp3* mRNA expression without affecting the stimulation of RANKL/OPG ratio mRNA expression. In contrast, addition of PKC pathway inhibitor (GF109203x) and calcium pathway inhibitor (BAPTA-AM) blocked the PTH stimulation of RANKL/OPG ratio gene expression without affecting the *Ramp3* mRNA expression. Treatment with PTH activated the translocation of NFAT into the nucleus. Our previous work and other studies have shown that activation of calcineurin can stimulate NFAT translocation into the nucleus by PTH. To confirm this the POBs were treated with the calcineurin inhibitors cyclosporine (CsA) and the FK506. Both inhibitors blocked the PTH stimulation of RANKL/OPG ratio mRNA expression. Treatment with the inhibitor of CaMKK pathway (ST-609) also blocked the PTH regulation of RANKL/OPG expression. We then showed that ST-609 blocked the translocation of NFAT into the nucleus by PTH. In addition, our preliminary data also suggested the involvement of CREB as CaMKK inhibitor blocked the PTH increased phosphorylation of CREB in the nucleus.

Conclusions: In summary, our data suggest that the PTH regulation RANKL/OPG expression occurs via the PKC and calcium/calmodulin-dependent CaMKK/calcineurin/NFAT signaling pathway. The data suggest that to improve the potential of PTH as a therapy for orthodontic protocols different signaling pathways can be targeted individually.

Future Directions: The role of the PKC pathway is difficult to address. We will consider other transcription factors that have been found downstream of PKC, such as Nf-kappaB.

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Evaluating the Effectiveness of a Formal Care Path for Discharge of Infants with Bronchopulmonary Dysplasia (BPD) from the NICU: A Pilot Study

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Background/Objectives: Infants with BPD pose a challenge to caregivers even after hospital discharge because of their complex needs. These are associated with high number of clinic visits and prescriptions per year as well as twice the rate of re-hospitalization in the first year of life (49%) as compared to infants without the condition^{1,2}. There are no formal plans of care shown to improve parent's knowledge and confidence in the care of their infant with BPD. Furthermore, caregivers of infants are often non-adherent with injury prevention guidelines regardless of health literacy, suggesting that educational tools for parents must go beyond addressing health literacy disparities³. This pilot study aims to assess the effectiveness of a BPD Care Path (CP) in improving parents' knowledge and confidence to care for their infants with BPD after discharge.

Methods: A prospective pre-post educational intervention observational study was conducted at the CCMC NICU in Farmington, CT. Parents were surveyed using a convenience sampling approach before and after participating in a formal BPD CP which included: a) an initial multidisciplinary BPD CP meeting with a written care-plan and a checklist of tasks provided to the parents; b) gradual introduction of knowledge material by caregivers through one on one teaching, handouts and videos and c) documenting of parents' competencies by providers for all checklist items prior to infant's discharge. The baseline questionnaire survey was done with consenting parents when their infant with BPD was deemed likely to be discharged on medication. The formal BPD CP was started 2-4 weeks before anticipated discharge. Post BPD CP surveys were administered at discharge and again at clinic follow-up in 3-6 weeks. Surveys were scored with points for correct and negative points for incorrect answers to multiple choice questions assessing knowledge. Graded points were given for degrees of confidence expressed using Likert scales. Using non-parametric Friedman's Q and Wilcoxon Signed-Ranks tests, knowledge (K), confidence (C) and total composite (T) scores of responses were compared at baseline, discharge and follow up.

Results: Of 19 infants with BPD whose parents qualified, 17 were enrolled and surveyed. Three participants did not complete the discharge survey and two were lost prior to follow up. There was a significant difference between K, C and T across the three periods of response. K, C and T at discharge were significantly higher than K, C and T at baseline prior to BPD CP. C and T at follow up 3-6 weeks after discharge were not significantly different than at discharge, but remained significantly higher than baseline pre-BPD CP scores.

Conclusions: A formal CP for parents of infants with BPD can increase knowledge and confidence prior to discharge without significant drop in knowledge retention at follow up.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Quantification of Proteoglycan 4 (PRG4) Suggests Elevated Levels in Sjögren's Syndrome Patient Saliva

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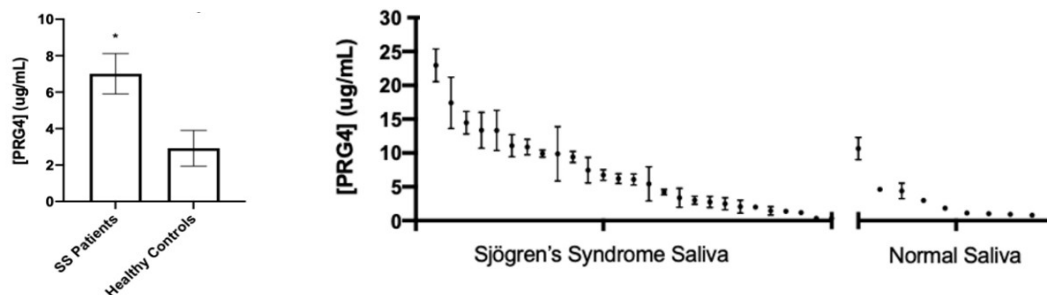
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Objective: Proteoglycan 4 (PRG4, also known as lubricin), a mucin-like proteoglycan known for its lubricating role in synovial joints and recently discovered on the eye, has been shown to improve clinical signs and symptoms of dry eye. Interestingly, over 30% of patients in the clinical trial had Sjögren's Syndrome (SS), an autoimmune disease characterized by severe xerostomia, dry eye, and various other systemic symptoms. PRG4 has yet to be detected and quantified in saliva, let alone in SS patients; therefore, the objective of this study was to determine PRG4 levels in SS patient saliva as compared to healthy controls.

Methods: SS patient saliva samples (n=27) were collected and provided by the UCSF-Gladstone CFAR Specimen Bank Core. Saliva from healthy controls (n=10) was obtained from BioIVT (Westbury, NY). A customized AlphaLISA immunoassay was optimized for determining PRG4 concentration in saliva samples. Samples were tested in multiple dilutions in PBS for reproducibility.

Results: We found that SS patients have significantly higher concentrations of PRG4 in the saliva compared to healthy controls ($7.01 \pm 1.11 \mu\text{g/mL}$ compared to $2.92 \pm 0.98 \mu\text{g/mL}$; $p=0.0414$ by two-tailed t-test). Results are shown in the figure below as mean $\pm$ standard error of the mean. The figure on the right shows the ranked sample concentrations with error bars representing the standard error of the mean of technical replicates (n=3 to 9 replicates per sample).



Conclusions: This is the first study to quantify PRG4 in saliva and the results suggest that patients with Sjögren's Syndrome have elevated salivary PRG4 concentration. This difference may be impacted by altered PRG4 fragments that are overestimated by the immunoassay, but this remains an open area of investigation. By revealing the differential levels of PRG4 in SS patient saliva and normal saliva, we have laid the groundwork for future investigation into PRG4's potential as a salivary biomarker and therapeutic for patients with SS.

Future Directions: Future work should integrate PRG4 quantification with patient salivary flow rates to determine the bioavailability of PRG4 in the mouth and whether PRG4 is simply more concentrated or if its expression is increased in SS patients.

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Patient Perceptions of Financial Conflicts of Interest in Orthopaedic Surgery

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Many orthopaedic surgeons receive industry contributions to their research or personal finances. It is unclear how this relationship is perceived by patients, and what magnitude they think it may impact physician practice. Historically patients have not felt that industry compensation affects their care¹. In a study between 2013 and 2014, orthopaedic surgeons had the largest number of discrete payments of any medical subspecialty (295,465) along with the highest total payment value (\$357,528,020) from industry². It is unclear how this relationship is perceived by patients, and at what magnitude they think it impacts physician practice. The Sunshine Act exist for disclosure of such information³. While this information is available, there is little information on how facile patients are in obtaining it. It is assumed that most patients are unconcerned about orthopaedic surgeons' financial conflicts and are unaware of the Sunshine act's mandate. Data was collected over one year, in a cross section of hospital based and community outpatient settings. Categorical data were analyzed with relation to quantitative data via ANOVA testing. Chi-squared analysis was employed to evaluate statistically significant differences between categorical variables. 513 patients were surveyed in total. Significant data revealed that patients with higher income and more education are more likely to be concerned about potential COIs. 43% of patients responded that the importance of disclosure was either moderately, very, or extremely important. 76% of orthopaedic surgery patients were not aware of the Sunshine Act. Orthopaedic surgery patients in this study were not concerned with physician compensation from industry. Most patients had not heard of the Sunshine Act, although education was positively correlated with awareness. Patients did not believe their physician's choices about their medical care would be influenced by gifts or compensation received.

Supported by: NTH Dimensions NDSI and John's Hopkins University Orthopaedic Department

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The Impact of Income Level on Ovarian Cancer Care and Outcomes in New York State

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Background/Objectives: Ovarian cancer is the deadliest subtype of gynecological cancers with a 5-year survival rate of 47.4%^{1,2}. Although survival is increasing overall, this benefit is not equally shared among women of all racial and socioeconomic statuses³. Women in lower socioeconomic groups have higher mortality rates compared to women with higher socioeconomic status, but income level alone has not been established as a predictor of survival³. This study sought to correlate average income levels from areas within New York State that have hospitals with patient outcomes and type of care received.

Methods: New York State ovarian cancer patient data was obtained from the open access SPARCS database to assess patient disposition at discharge and what types of procedures were performed on patients during their hospital stay. The zip code of each hospital's address was used to determine the average income for the region and stratify the hospitals into three distinct groups: high income group, mid income group, and low income. Data regarding patient disposition and procedures were aggregated from the SPARCS database.

Results: The patients in the high income group had better outcomes than the mid or low income groups, with 3.8% of patients expiring compared to 7.0% of patients in the mid income group expiring and 11.0% of patients in the low income group expiring. In addition, patients in the low income group were more likely to have no procedures performed during their hospital stay, with 12.7% of patients not receiving any intervention compared with 9.9% and 9.5% of patients in the high and mid income groups, respectively.

Conclusions: This study further reinforces the fact that patients in high income areas have a greater likelihood for survival and suggests that patients in low income areas may not receive the same standard of care.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Age and Cancer History as Risk Factors of Pre-Existing Autoimmunity in Patients Receiving Checkpoint Inhibitor Treatment for Metastatic Melanoma: A Large Retrospective Study.

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Background/Objectives: While immune checkpoint inhibitors (ICIs) have improved the survival rates of metastatic melanoma in recent years, immune-related adverse events (irAEs) remain a major toxicity. Studies have established that pre-existing autoimmunity increases the risk of severe irAEs following ICI therapy (1). However, there is controversy among clinical trials and case reports concerning age and metastasis increasing risk of irAEs (2). In order to understand potential irAE risk following ICI treatment in the community setting, we measured prevalence of pre-existing autoimmune diseases by age and presence of metastasis.

Methods: We studied 293,938 patients aged 18-106 years old who were treated at the University of Connecticut Health Center between 2000 and 2018 using billing records. Patients were organized into four study groups based on ICD-9 and ICD-10 codes, specifically primary melanoma and three comparisons groups: non-cutaneous neoplasms alone, melanoma with non-cutaneous neoplasms, and patients without cancer history. A list of 340 ICD codes corresponding to 105 autoimmune conditions were queried.

Results: Non-cutaneous cancer, in the absence or presence of melanoma, was associated with a higher prevalence of autoimmunity (27.0%, 29.4%, respectively) compared to the rates in patients with melanoma and without cancer history (11.1%, 8.7%, respectively, $p < 0.05$). In patients with both melanoma and non-cutaneous cancers, those with metastases had an 8.9% increase in autoimmune prevalence compared to patients without metastases, the largest increase observed across all cancer groups ($p < 0.05$). Lastly, a logistic regression demonstrated that age is positively correlated with autoimmunity ($p < 0.0001$).

Conclusions: The findings suggest that a history of metastasis, non-cutaneous cancer, and advanced age are associated with a higher prevalence of autoimmunity in melanoma patients. As ICIs are indicated for metastatic melanoma, our findings warrant careful risk assessment and monitoring of autoimmunity in senior patients. Future studies of irAE development are needed to corroborate our findings.

Supported by: The UConn School of Medicine Summer Research Fellowship

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One-Year Readmission Rates of Connecticut Infants Diagnosed with Early Onset Neonatal Sepsis from 2007-2017

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Background: Neonatal sepsis, defined as sepsis within 72 hours of birth, results in significant infant morbidity and mortality [1-3]. In Connecticut, statewide neonatal sepsis is a mandatory reportable condition. Readmissions associated with this condition have not previously been described.

Methods: We identified cases of neonatal sepsis from 2007–2017 and assessed readmissions during the first year of life using a statewide hospital discharge database. Information from these datasets were used to describe readmission rates, causes and timing of readmission, and demographic and clinical factors associated with readmission among infants with neonatal sepsis. Frequencies of demographic/clinical factors for admitted and non-readmitted patients were calculated, as well as frequencies of ICD codes associated with readmissions.

Results: Of 274 neonatal sepsis cases during the study period, 269 matched in the discharge data, and among this group 224 (83%) survived the initial hospitalization. During the first year of life 51 (19%) were readmitted. The most frequent reasons for readmissions were pulmonary (19%), systemic (vital sign abnormalities, sepsis) (17%), and gastrointestinal conditions (13%). There were no significant differences in demographic or clinical factors between readmitted and not readmitted infants, with the exception of initial infant hospital stay ($p=0.039$). Stratification of readmitted infants by gestational age showed that readmitted full term infants have higher birth weights, more vaginal deliveries, and a shorter initial stay than readmitted pre-term infants (all $p < 0.05$).

Conclusions: A large proportion of infants diagnosed with neonatal sepsis in CT are readmitted within the first year of life. Infants with prolonged birth hospitalizations may be at higher risk for readmission and this group warrants intensified strategies to prevent readmission. Appropriate screening tools and education at initial discharge should be introduced to reduce first-year readmissions and healthcare costs among this highly vulnerable population.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Identifying Doses of Physical Activity That Are Required for Optimized Glycemic Control

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Background/Objectives: Suboptimal glycemic control in patients with Type 2 Diabetes (T2D) is linked to decreased life expectancy and increased risk of numerous cardiovascular diseases. Epidemiological studies have revealed that increasing rates of T2D are associated with sedentary behavior (1, 2). However, clinical studies indicate that interrupting sedentary behavior with intermittent bouts of physical activity improves T2D management (3, 4). Still, evidence supporting a dose-dependent response to physical activity and glycemic control in T2D patients is still lacking. The main purpose of this study is to 1) compare the lasting effects of varying durations of intermittent physical activity that interrupts prolonged sitting on glycemic control, 2) pro-inflammatory cytokines in diabetic patients and 3) determine a correlation, if any, between these factors over the course of a single day. The study also hopes to 4) identify an optimal bout of exercise that is applicable to workplace environments.

Methods: 27 T2D men and women aged 18-75, who understand English and do not have another major co-morbid condition are placed in either a 3-minute bout walking group, 6-minute bout walking group, or no walking group (control). Each hour participants would walk 0, 3, or 6 minutes on a treadmill. Each hour participants will have their blood glucose, Salimetrics insulin and cytokine panel collected. Statistical analysis comparing changes from baseline at each time point will be conducted using ANOVA. A paired t-test will be used to compare changes over time back to baseline, separately by group.

Results: The results of this study are still pending and are expected to be obtained by the end of 2021.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Characterizing Downstream Regulation Chondrogenic Differentiation of Induced Pluripotent Stem Cells through a SOX9 Reporter

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Objective: Fate choices of a stem cell are dictated by transcription factors. SOX9 is a cartilage-specific transcription factor that is upregulated during the process of differentiation of skeletal stem cell (SSC) into chondrocytes.^{[1],[3]} Primary SSCs and transformed cell lines have limitations in that they have a terminal life span or have abnormal cell cycle regulation, respectively. iPSCs have unlimited replication potential and can be differentiated by defined factors/conditions which make them attractive for use as a reporter cell line. The objective of the project was to create a SOX9 reporter induced pluripotent stem cell (iPSC) line, which will be utilized in characterizing the downstream effects of SOX9 expression.

Methods: The SOX9 DNA targeting donor was generated with homology arms flanking the mCherry reporter and puromycin resistance gene. iPSCs were co-transfected with the SOX9 DNA targeting donor and SOX9-specific CRISPR/Cas9. The transfected iPSCs were selected with the antibiotic, puromycin. Single colonies were picked and expanded. Genomic DNA of the iPSCs was screened by PCR to validate that the reporter gene was correctly inserted. Then, cytokines/inhibitors were added to induce the differentiation of iPSCs. Pictures of the cells were acquired with a real-time imaging system, IncuCyte.

Results: The SOX9 mCherry reporter (targeting donor construct) was successfully inserted downstream of exon 3 of the Sox9 gene using CRISPR/Cas9 in an iPSC line, and validated by PCR analysis. Differentiation of the iPSC line shows that iPSCs do not fluoresce in the absence of induction, whereas they dramatically increase fluorescence after induction. This demonstrates the mCherry reporter is under the regulation of the SOX9 promoter.

Conclusions and Future Directions: Previous studies demonstrated that SOX9 plays multiple roles including, but not limited to, embryogenesis of cartilage as well as repair after bone fracture injuries.^[2] Now that we have established a SOX9 iPSC reporter line, we can utilize the iPSCs to characterize SOX9 expression during the process of chondrogenic differentiation process of iPSCs.

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1. *NIDCR Summer Dental Student Award, National Institute of Dental and Craniofacial Research, National Institutes of Health, Department of Health and Human Services.*
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Onyiuke Grading Scale: A clinical classification system for the diagnosis and management of Bertolotti Syndrome

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Background: Lumbosacral transitional vertebrae (LSTV) is a common anatomic variant of the spine, characterized by the formation of a pseudoarticulation between the transverse process of the lumbar vertebrae and sacrum or ilium. LSTVs have been implicated as a potential source of low back pain – dubbed Bertolotti Syndrome. Traditionally, LSTVs have only been subdivided into types I-IV based on the Castellvi radiographic classification system.

Objective: Solely identifying the type of LSTV radiographically provides no clinical relevance to the treatment of Bertolotti Syndrome. Here, we seek to analyze such patients and identify a clinical grading scale and diagnostic-therapeutic algorithm to optimize care for patients with this congenital anomaly.

Methods: Patients presenting with back pain between 2011 and 2018 attributable to a lumbosacral transitional vertebra were identified retrospectively. Data was collected from these patients' charts regarding demographic information, clinical presentation, diagnostic imaging, treatment and outcomes. Based on evaluation of these cases and review of the literature, a diagnostic- therapeutic algorithm is proposed.

Results: Based on our experiences evaluating and treating these patients and review of the existing literature, we propose a clinical classification system for Bertolotti Syndrome: we proposed a 4- grade scale for patients with Bertolotti syndrome based upon location, severity, and characteristics of pain experienced due to LSTVs.

Conclusion Based on our experience with the cases illustrated here, we recommend managing patients with LSTV based on our diagnostic -therapeutic algorithm. Moving forward, a larger prospective study with a larger patient cohort is needed to further validate the treatment paradigm.

Effects of Increasing Meniscal Extrusion on Tibiofemoral Contact Areas and the Efficacy of a Centralization Procedure

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Background/Objectives: Meniscal extrusion has been associated with cartilage damage and osteoarthritis.^{1,2} It is arbitrarily divided into minor (≤ 3 mm) and major (> 3 mm) categories.^{1,2} To treat meniscal extrusion, a centralization procedure has been designed to stabilize and maintain meniscal function.³ The purpose of this study is to objectively describe the effects of increasing meniscal extrusion at varying degrees of flexion and determine if a centralization procedure can return contact area to the intact state.

Methods: Twelve fresh-frozen cadaveric knee specimens 18 years or older with no prior knee injuries were dissected to the articular capsule. A Tekscan pressure sensor was placed underneath the medial and lateral menisci. The knees were tested at 0°, 30°, 60°, and 90° of flexion in the intact, 2 mm, 3 mm, 4 mm, maximal extrusion, and centralization repair state.⁴

Results: Six right and seven left knees were analyzed. Average age was 52.85 ± 5.27 (43-60) and 62% were female. The difference between contact areas in the 2-3 mm extrusion and the 4 mm-maximum extrusion state was 57.9 ($p = 0.11$), 43.1 ($p < 0.05$), 67.4 ($p < 0.001$), and 69.5 ($p < 0.001$) mm² for 0°, 30°, 60°, and 90° of flexion, respectively. The difference between contact areas in the intact state and the centralization procedure was 94.8 ($p = 0.094$), 13.5 ($p = 0.658$), 36.8 ($p = 0.173$), and 79.6 ($p < 0.05$) mm², for 0°, 30°, 60°, and 90° of flexion, respectively.

Conclusions: Our study demonstrated statistically significantly more contact area in the 2-3 mm compared to the 4 mm-maximum extrusion state in 30°, 60°, and 90° of flexion, which supports prior research about the division between minor (≤ 3 mm) and major (> 3 mm) categories of meniscal extrusion. The centralization repair technique did not have statistically significant contact area differences from the intact state in 0°, 30°, and 60° of flexion.

Supported by: The UConn School of Medicine Summer Research Fellowship and Arthrex, Inc.

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Bedside Ultrasound to Assess Acute Central Venous Pressure Change during Treatment of Decompensated Heart Failure

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Background/Objectives: Accurate volume status assessment is crucial for the treatment of acute decompensated heart failure (ADHF)¹. Volume status assessment by physical exam is inaccurate, necessitating invasive measurement with right heart catheterization (RHC), which carries safety, pragmatic (scheduling, holding anticoagulants, etc) and financial burdens². Therefore, a reliable, non-invasive, cost-effective alternative is desired. Previously, Dr. Pacella's group at UPMC developed ultrasound (US) based technique to measure internal jugular vein (IJV) compliance during RHC which was used for single time point central venous pressure (CVP) predictions³. We now aim to apply this technique to track acute changes in CVP during diuresis for ADHF in-patients with an in-dwelling pulmonary artery catheter.

Methods: We used an observational, prospective study design and recruited 15 patients from the Critical Care Unit (CCU) between 7/19-12/19 being treated for ADHF (systolic or diastolic) with IV diuretics +/- inotropic agents who underwent PA catheter insertion for continuous CVP monitoring. 13 of 15 patients received milrinone infusions. US images of the IJV were obtained at end expiration and during the strain phase of Valsalva at multiple 2-3 hr. intervals. Change in IJV cross sectional area (ImageJ) was used as a measure of IJV compliance. Patients unable to perform the Valsalva maneuver were excluded.

Results: Calculated % change in CSA of IJV was plotted against CVP. An inverse relationship was observed between CVP and % change in CSA of IJV. The data was fit with an inverse exponential regression ($R^2 = 0.36$, root mean square error = 3.19). Fivefold cross validation showed a stable model for predicting CVP based on change in CSA ($R^2 = 0.34$, root mean square error 3.26)

Conclusions: Serial portable US assessment of IJV compliance can act a surrogate measure of CVP and therefore provides reliable information on acute hemodynamic changes in ADHF.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Intraoperative and *in vitro* Classification of Subacromial Bursal Tissue for Use in Biological Augmentation of Rotator Cuff Repair

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Background/Objectives: In the past subacromial bursa was often removed during arthroscopic shoulder surgery.¹ Bursa has subsequently been shown to contain pluripotent mesenchymal stem cells (MSCs).² This discovery has led to increased interest in bursa in the field of tissue repair.³ The purpose of the research is to classify subacromial bursa using intraoperative and *in vitro* characteristics from specimens harvested during arthroscopic shoulder surgery in an attempt to improve outcomes with biological augmentation.

Methods: Subacromial bursa was harvested over the rotator cuff (RC) from 48 patients undergoing arthroscopic shoulder surgery. Specimens were characterized intraoperatively by location (RC tendon or muscle), tissue quality (percent adipose or fibrous), and vascularity. Nucleated cell counts were determined after 3 weeks of cell culture and histological sections were reviewed for fatty infiltration, fibrosity, and vascularity. MSC surface markers were analyzed via flow cytometry to confirm cellular identity, and cellular migration was investigated using a fluoroscopic assay.

Results: Intraoperatively, muscle bursa was found most often to have > 50% fatty infiltration (n = 39), while tendon bursa showed majority fibrous tissue (n = 32). Cellular proliferation was not significantly associated with intraoperative tissue quality or vascularity. However, tendon bursa demonstrated significantly greater proliferation potential than muscle bursa ($P = 0.00015$). Histological assessment of fatty infiltration was moderately correlated with gross tissue fattiness ($\rho = -0.626$, $P = 7.14 \times 10^{-11}$). Flow cytometry showed that 90-100% of bursal cells were positive for MSC surface markers (CD73, CD90, CD105). Peak cellular migration rates occurred between 18-30 hours incubation.

Conclusions: Overall, bursa characteristics were not found to consistently correlate with cellular proliferation. However, subacromial bursa taken from the RC tendon consistently demonstrated increased proliferation potential when compared to RC muscle. These results have the potential to aid surgeons in quickly identifying the most viable bursa samples for biological augmentation.

Supported by: The UConn School of Medicine Summer Research Fellowship; UConn Department of Orthopaedic Surgery.

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Understanding Return To Work Recommendations after Spinal Surgery

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Background/Objectives: There is a knowledge gap in the literature on the topic of spinal surgery and return to work (RTW) recommendations. This lack of evidenced-based recommendations likely results in either delayed RTW and lost productivity, or may lead to early RTW and re-injury. The goal of this study is to establish the current practices among spinal surgeons with regards to RTW recommendations. We hypothesized that there would be variability in RTW recommendations among the spinal surgeons surveyed.

Methods: An electronic survey consisting of seven general practice questions and three RTW recommendation clinical vignettes was administered to spinal surgeons who are members of the International Society for the Advancement of Spine Surgery and the Society for Minimally Invasive Spine Surgery. For inferential statistics, we ran two types of analyses. Chi square goodness of fit was used to determine how much our data deviated from what would be expected if agreement was equal across all the response categories provided. Logistic regression was then used to explore whether the variables we collected (clinical experience, region, etc.) were predictive of whether a surgeon favored early or late return to work when considering the occupation of the clinical vignette patient.

Results: The majority of the surgeons surveyed (n= 320) practiced outside of the US (53%), in a private clinic (42%), had over 20 years of experience (54%), and had a volume of 200 spinal surgery cases per year (42.1%). The clinical vignettes showed that surgeons are more likely to recommend a longer RTW for those that are manual laborers vs. sedentary laborers. Alarming, there was no majority consensus seen in any of the vignettes, aside from a manual laborer undergoing a TLIF procedure where the RTW recommendation was 12 weeks (74%).

Conclusions: There is variability in RTW recommendations among spinal surgeons. The results indicate a need for the establishment of evidence-based RTW recommendation guidelines after spinal surgery.

Supported by: The UConn School of Medicine Summer Research Fellowship and the UConn Department of Orthopaedic Surgery.

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2-octyl Cyanoacrylate as Post-Operative Wound Care for Electrodesiccation and Curettage

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Background/Objectives: Non-melanoma skin cancers (NMSC) are usually treated with electrodesiccation and curettage (ED&C) followed by daily application of white petroleum jelly under an occlusive bandage. Patients find it difficult to change their dressings daily, especially if the wounds are not within easy reach. We believe that the single time use of an adhesive bandage known as Dermabond (2-octyl cyanoacrylate) rather than daily applications of white petroleum would be preferable to patients. We expect to see improved wound healing, reduced complications, improved cosmesis, and improved patient satisfaction and comfort. This is a pilot study to examine the possibility of changing and improving the standard wound care modality of NMSC's following ED&C.

Methods: Many patients with NMSC have more than one NMSC requiring ED&C. Therefore, a crossover study design was implemented, in which the patient was split into two – half of the ED&C wounds were treated with the standard wound care (white petroleum) and the other half treated with Dermabond. Thus, each patient serves as their own control.

The patients will be scheduled for a series of follow-up appointments. Initially, patients will be seen one week post-operatively followed by every three months for one year should no complications arise. Weekly telephone encounters will be performed until the surgical site is completely re-epithelialized to compare rates of healing. At each of the in-person follow-ups, three types of data will be collected: 1) the patient will be administered a survey assessing patient attitudes towards both wound care methods; 2) photographs of the surgical site will be obtained that will be evaluated for cosmesis by an investigator that is blinded to wound care method; 3) data about wound related complications (infection, hypergranulation, etc.) will be obtained.

Results: Preliminary data does show that Dermabond works as hypothesized – cosmetic appearance and ease of care both improve with the Dermabond method as opposed to white petroleum. Conclusive results will be seen when follow-up appointments are performed for the full cohort.

Conclusions: Future directions for this project include performing the complete split-back procedure for the entire cohort. Further, these patients must return for follow-up appointments extending up to a year from their initial surgery date. Initial data is promising for Dermabond's use as a wound care modality.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Antibiotic Prescribing Among Periodontists

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Objective: Antibiotics are important in the treatment of odontogenic infections, and in the prevention of systemic infection and secondary complications of bacteremia during dental procedures in high-risk patients. Little is known about antibiotic prescribing among periodontists, including the indicated prescription frequency (treatment and prophylaxis), the antibiotic selection and durations, and the frequency and impact of antibiotic allergy among patients in periodontal practice who are prescribed antibiotics. The goal in this study was to investigate antibiotic prescribing patterns by periodontists in an outpatient academic periodontal practice in order to identify potential opportunities to optimize prescribing practices.

Methods: This retrospective cohort study analyzed all antibiotic prescriptions by periodontal residents and faculty at the University of Connecticut Outpatient Dental Clinic between 2014 and 2017. Any prescription written by a resident or faculty member during the study period was considered for inclusion (duplicates were excluded), and information was manually extracted from the electronic medical record. Antibiotic prescriptions were stratified into three indication categories: pre-procedural prophylaxis, post-procedural prophylaxis, and treatment. Prophylactic antibiotic prescriptions were defined as those written in the absence of clinical signs and symptoms of infection. Additional variables included patient demographics, smoking history, medical comorbidities, exam findings, diagnoses, antibiotic dose and frequency, and dental/surgical interventions on the day of prescription.

Results: Out of 275 prescriptions analyzed, 266 met inclusion criteria as non-duplicate prescriptions, and the most prevalent antibiotic indication prescribed was post-procedural prophylaxis (n = 130, 48.87%), followed by pre-procedural prophylaxis (n = 52, 19.55%) and treatment (n = 35, 13.16%). Amoxicillin was the most frequently prescribed antibiotic across all groups (n = 236, 88.72%), followed by clindamycin (n = 22, 8.27%). Most patients presented in a non-emergent setting (n = 200, 75.19%), without pain (n = 210, 78.95%), and had restorative/endodontic-related clinical findings (n = 55, 20.68%). Among the 35 patients receiving antibiotics for infection treatment, 8 (22.86%) underwent a surgical intervention on the date of antibiotic prescription. Of the 130 patients receiving post-procedural prophylaxis, 121 (93.08%) received a surgical intervention on the day of visit including bone surgery (n = 87, 66.92%), extraction (n = 53, 40.77%) and implant surgery (n = 42, 32.31%).

Conclusions: Among antibiotics prescribed by periodontists, our data highlights that a large proportion are prescribed as post-procedural prophylaxis. We also identified opportunities for improvement in data collection and recording, specifically for the diagnosis and antibiotic allergies/reactions, as this information would better optimize antibiotic prescribing patterns.

Future Directions: These findings emphasize the need for future research to evaluate the impact of antibiotic prescribing in the management of periodontal infections, and highlights the need to develop evidence-based guidelines on antibiotic prescribing in periodontology.

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HMGB1 as a Direct Inhibitor of Oligodendrocyte Maturation

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Background/Objectives: Recent findings indicate that resident oligodendrocyte progenitor cells (OPCs) have an innate potential to differentiate to provide remyelination in patients with diseases like multiple sclerosis (MS), but this potential is limited by the disease. Our lab has determined that extracellular High Mobility Group Box 1 (HMGB1) is expressed at high levels in white matter lesions in MS patients and can act to directly suppress oligodendrocyte maturation. We tested pharmacological inhibitors of each HMGB1 receptor candidate (TLRs-2, -4, -9 and RAGE) to evaluate which receptor pathway(s) mediates the inhibitory effects of HMGB1 on oligodendrocyte maturation.

Methods: Recombinant murine HMGB1 was applied to primary OPC cultures grown under differentiating conditions both with and without pharmacologic inhibitors of the following receptors: TLR-2, TLR-4, TLR-9 and RAGE. Each inhibitor was tested individually in a range of concentrations to determine whether blocking that receptor is sufficient to increase OPC maturation when compared to treatment with HMGB1 alone. Immunocytochemistry was used to evaluate stages of maturation of oligodendrocytes.

Results: Pharmacologic inhibitors of TLR-2 and TLR-9 were found to increase OPC maturation rates compared to HMGB1 alone. TLR-4 and RAGE inhibitors did not significantly change OPC maturation in our cultures.

Conclusions: HMGB1 inhibits oligodendrocyte maturation through TLR-2 and TLR-9. Further elucidation of this pathway can help identify approaches to restore neurologic function in MS patients.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Title of Project: Perceptions and Knowledge of Kangaroo Mother Care and Associated Health Benefits among New Parents and Healthcare Workers in the Kisoro District of Uganda

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Background/Objectives: Neonatal mortality is a major health and welfare concern in the developing world.³ Kangaroo Mother Care (KMC) is a low-cost, effective method of improving health outcomes in neonates, however it is underutilized in resource-limited settings.² This study sought to examine and describe the knowledge, attitudes, barriers and practice (KABP) related to KMC at St. Francis Mutolere Hospital in the Kisoro District of Uganda and identify areas of culturally and practically appropriate interventions for future work.

Methods: New parents and healthcare workers were recruited from the maternity ward at St. Francis Mutolere Hospital in the Kisoro District of Uganda over 8 weeks. Using KABP surveys specific to new parents or healthcare workers, following a standardized script describing KMC to all participants, semi-structured interviews were conducted in the presence of a translator.

Results: 175 new parents and 30 healthcare workers completed interviews. Only 20% of new parents knew of the practice to skin-to-skin before survey administration. Less than 3% of parents reported receiving information about KMC from healthcare workers at St. Francis Mutolere, while 77% of healthcare workers reported having conversations about KMC with patients regularly. 94% of new parents and healthcare workers agreed that KMC is healthy for all newborns. Healthcare workers and new parents expressed concerns related to KMC across the domains of physical health, lack of current knowledge and time restraints, and both groups noted motivational aspects across the domains of bonding and improvement of physical health.

Conclusions: We identified a gap in communication between provider knowledge and patient teaching in regards to KMC. Healthcare worker's awareness and knowledge surrounding KMC exceeds that of the patient population in this community, where KMC appears to be viewed favorably. Therefore, there may be a potential for future intervention to increase KMC practice and potentially improve health outcomes for newborns.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Female presenters at American Society of Pediatric Otolaryngology (ASPO): 2002 to 2017

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Background/Objectives: Otolaryngology continues to have a workforce gender disparity, despite an overall increase in female physicians. In 2002, only 10.04% of practicing otolaryngologists were female, compared to 17.1% in 2017. Currently, the gender distribution of presenters at American Society of Pediatric Otolaryngology (ASPO) is unknown. Our objective was to assess the proportion of female speakers and presenters at the ASPO annual conference from 2002 to 2017.

Methods: Data was collected from 536 presentations across the four years (2002, 2007, 2012, and 2017). For each presentation, the type (poster, panel, abstract, keynote, lecture, presidential welcome, award) was recorded from annual conference programs, and a targeted search was performed to determine gender of the speaker or first author, senior or last author, panelist, and moderator. Chi-square was used to compare proportions of female presenters.

Results: In total, the proportion of female presenters (oral abstract, poster, panel, lecture, and keynote) increased from 2002 (22.3%) to 2017 (45.9) ($p<0.001$). The proportion of female oral abstract presenters increased (11.8% in 2002 vs. 44.2% in 2017, $p<0.001$). Women comprised 17.2%, 30.0%, 38.6%, and 43.5% of all speakers in 2002, 2007, 2012, and 2017 respectively, with a significant increase from 2002 to 2017 ($p<0.001$). In 2002, 30.0% of poster first authors were female, as compared to 50.3% in 2017 ($p=0.022$).

Conclusions: As the number of women entering otolaryngology increases, research activity is also likely to increase. Our study indicates that there has been an increase in proportion of women presenting at ASPO. Ongoing efforts are important to support the continued advancement of women within pediatric otolaryngology.

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Contributions to the Management of Hypertension in Cusco, Peru: Impact of Knowledge and Healthcare Access on Hypertension Control

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Background/Objectives: Uncontrolled hypertension (HTN) can result in damage to blood vessels and organs, which can lead to myocardial infarction, stroke, aneurysm, heart failure, as well as other cardiovascular complications (1). In 2015, a report of the prevalence of hypertension in Peru was given as 9.5%, with 11.9% of women and 7.9% of men being affected (2). This research project was conducted in order to identify major unmet needs in awareness, treatment, and control of HTN. It identified social, economic, and geographical barriers to HTN management that exist in the various regions of Cusco. The goal is to help medical caregivers formulate a region- and patient-specific approach to HTN management in Cusco, Peru.

Methods: Adult participants with hypertension (N=68) were recruited over 8 weeks. Participants were recruited from medical brigade clinics, local clinics and health posts, and health fairs. Each patient was screened by the medical team as part of a routine visit, and those who were 18 years or older with a reading of elevated blood pressure upon presentation or with a history of HTN were asked to participate in the study. A survey was administered verbally in Spanish to the participant.

Results: The sample was 61.8% female. Most of the subjects do not drink alcohol, have heart disease, or a history of CV event. Over half of the participants have a family member with HTN, but most do not have a family history of heart problems or stroke. From the answers on the questionnaire, a knowledge score and barriers to healthcare score was calculated. The study found that subjects who live in rural areas have lower blood pressure readings than those who live in urban areas (Rural: mean pressure of 139/80; Urban: mean pressure of 147/91, $p < .001$). A higher barriers to healthcare score has a positive correlation with poorly controlled blood pressure, however higher knowledge scores did not correlate with better controlled blood pressure.

Conclusions: This research has helped to identify major unmet needs in management of HTN in the Sacred Valley region of Peru. From this research, important factors identified to help blood pressure management are barriers to healthcare access. Among individuals with known hypertension, about two-thirds were uncontrolled, and the most frequent barrier identified was inability to pay for medications. Resources directed towards these barriers may improve outcomes in this setting. Improved hypertension control may prove to be beneficial in reducing death and disability from various causes among the Peruvian population.

Supported by: UConn School of Medicine Summer Research Fellowship

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Dissolution of Biomimetic Carbonated Apatite Following Exposure to Varied Xerostomia Treatments

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Objective: Xerostomia, commonly known as dry mouth, is caused by low or absent flow of saliva^[1]. The common treatment with lubricating oral rinses provides temporary relief of the discomfort associated with dry mouth, however it remains unclear what effect these may have on enamel mineralization^[2,3]. The objective of this study was to analyze the dissolution effects of varied xerostomia oral rinse treatments on biomimetic carbonated apatite.

Methods: Biomimetic apatite powder was synthesized at 2%, 6%, and 12% carbonate by weight to represent enamel, dentin, and a pathological state, respectively. Each weight was dissolved individually for 72 hours in phosphate buffered saline (PBS), ACT Dry Mouth Anticavity Fluoride Mouthwash®, Biotène Dry Mouth Oral Rinse®, or tap water, each at pH 5.5, 7.4, 8.0, and unmodified (as out of the bottle). The powders were then filtered and analyzed using the following techniques: mass loss, Raman spectroscopy, and x-ray diffraction. Statistical analysis was performed using one way ANOVA Tukey comparisons.

Results: While all tested conditions caused mass loss, it was irrespective of solution. It was also found that powders exhibited less buffering at higher pH. Furthermore, compositional changes in CO_3^{2-} were found to be dependent on solution. Of the two commercial rinses tested, Biotène Dry Mouth Oral Rinse® caused less carbonate loss than ACT Dry Mouth Anticavity Fluoride Mouthwash®. For 2% weight carbonate powders at unmodified pH, the mean percent changes in $\Delta\text{CO}_3^{2-}/\text{PO}_4^{3-}$ for Biotène, ACT, and tap water were (23.57, 53.13, -10.44) respectively. A statistically significant difference was found between all groups ($p < 0.002$). The tap water rinse caused a general gain in carbonate, while the others saw a loss in carbonate. Creation of fluorapatite was seen only in the ACT solution. Lastly, correlations between lattice spacing and CO_3^{2-} content indicated that the mode of substitution varies with solution.

Conclusions: In a patient that already is at high risk for caries due to lack of saliva, choosing an oral rinse treatment that will not increase further erosion risk is critical. The conclusions of this study remain that while further research is still needed, clinicians should consider these factors when advising patients on choosing an oral rinse to alleviate their symptoms.

Future Directions: Further research should address the mechanisms of carbonate gain and loss in these solutions, in addition to analysis of ICP-MS data to determine what was left in the solution post dissolution.

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Combinations of Pharmacological Agents Reduce Intracellular α -Synuclein Levels

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Background/Objectives: A hallmark of the neurodegenerative movement disorder Parkinson's disease (PD) are Lewy bodies, intracellular aggregations of the protein α -synuclein (α -syn). Overexpression of α -syn in cells impairs mitochondrial function and intracellular degradation mechanisms via autophagy or the proteasome that can remove excess α -syn.¹⁻³ In past work, we found that co-administration of the autophagy-inducer metformin with the lysosomotropic agent chloroquine surprisingly and significantly decreased α -syn levels independent of lysosomal or proteosomal degradation, transcriptional modulation, and unconventional secretion. In this study, the objective was to determine a mechanism for how drugs that modulate autophagy and mitochondrial function alter amounts of α -syn in cells, such as through translational effects or mitochondrial-associated degradation.

Methods: Various combinations of the autophagy-inducers rapamycin and metformin, autophagy inhibitor chloroquine, and oxidative phosphorylation uncoupler CCCP were applied to a differentiated SH-SY5Y neuroblastoma cell line induced to overexpress α -syn using the histone deacetylase inhibitor sodium butyrate. Cellular lysates were examined via Western blot for intracellular levels of α -syn, polyubiquitinated α -syn marked for degradation, and phosphorylated eukaryotic initiation factor 2 α (p-eIF2 α), the levels of which can increase when cells inhibit protein synthesis under stress.⁴ Western blot band intensities were quantified with LICOR Image Studio Lite software.

Results: CCCP treatment greatly decreased α -syn levels in all pharmacological combinations tested and was more effective than the combination of metformin and chloroquine. Additionally, CCCP decreased levels of p-eIF2 α and phosphorylated protein kinase R, the activator kinase for eIF2 α . α -syn was not found to be ubiquitinated in any pharmacological combinations examined.

Conclusions: While CCCP is likely cytotoxic for most cells, inhibition of mitochondrial function in some cells may initiate a unique pathway to reduce intracellular α -syn more efficiently, while at the same time reducing efforts to inhibit protein translation via eIF2 α . Future directions include exploring if α -syn is secreted from the cell upon treatment with CCCP. Therapeutic solutions with pharmaceuticals such as those used in this study may have potential to combat PD neurodegeneration.

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Effectiveness of Type 2 Thyroplasty vs. Botox Injections for Treatment of Adductor Spasmodic Dysphonia

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Background/Objectives: Adductor spasmodic dysphonia (AdSD) is a form of dystonia affecting the vocal cords, lending a strangled, interrupted quality to the voice. A poorly understood disorder affecting only ~1 in 100,000 individuals,¹ AdSD nonetheless causes considerable distress: the increased effort required to speak combined with reduced comprehensibility leads to increased rates of depression, anxiety, problems in relationships, problems at work,² and overall decreased quality of life.³ Since the 1980s, Botox injections into the vocal cords have been the gold standard of treatment, but they do not completely resolve symptoms,⁴ must be repeated indefinitely,⁵ and cause other undesirable vocal issues for many patients.² Several surgical methods have been developed with the goal of permanently resolving symptoms, but some studies have found that symptoms recur or that results are otherwise unsatisfactory.⁵ Type 2 thyroplasty (T2T) is a surgical method unique in its mechanical basis, customizability, and preclusion of the return of symptoms via nerve regrowth. We sought to compare the effectiveness of T2T to Botox injections.

Methods: Patients at the Hiroshiba ENT Clinic who received Botox injections followed by eventual T2T as treatments for AdSD completed Voice Handicap Indices (VHIs) after each treatment. The patients were treated as one population post-Botox, and as another post-T2T. The patients' post-Botox VHI scores were then compared to their own post-T2T VHI scores with ANOVA to determine whether there was a difference in mean VHI score between the two groups.

Results: Mean VHI score post-Botox was 17.2 and mean VHI score post-T2T was 17.7, with no statistically significant difference between groups ($p>0.05$).

Conclusions: T2T is equally as effective at treating AdSD as the gold standard of Botox injections. Given the significantly longer duration – and, in some cases, presumptively permanence – of results rendered by T2T, T2T is a treatment modality worthy of more research in AdSD patients.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Title of Project: Pregnancy-Related Venous Thromboembolism in African American Women with Sick Cell Trait

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Background/Objectives: Pregnancy is associated with increased risk of thromboembolism (VTE). People with sickle cell disease (SCD) have an increased risk of VTE overall and during pregnancy. Sick cell trait (SCT) is associated with increased risk for VTE. SCD and SCT are more prevalent in African Americans. There is limited knowledge on the impact of SCT on pregnancy-related VTE. We hypothesize that the prevalence of SCT is higher among pregnant and post-partum women with VTE compared to those without VTE.

Methods: Retrospective case-control study of pregnant African American women at Johns Hopkins Hospital, 2009-2019. Potential cases obtained from EPIC using ICD-10 codes and an OBGYN departmental database. Case defined as VTE during pregnancy or within 6 weeks postpartum. Controls was no VTE during pregnancy or postpartum. Manual chart reviews to confirm coding accurately reflected VTE.

Results: Study population consisted of 386 African American women with suspected VTE who delivered between 2009-2019. 38 (9.8%) cases of confirmed VTE during pregnancy or postpartum. 5 (13.2%) cases had SCT and the remaining were HbAA. Higher prevalence of SCT amongst cases than SCT prevalence in the general African-American population (13.2% vs 7%). SCT group had more gestational VTE (80%) compared with HbAA with more postpartum VTE (56%). There was a higher occurrence of PE and concurrent PE/DVT for SCT group (60% and 20% respectively) compared with HbAA (42% and 3% respectively), who had more isolated DVT.

Conclusions: The outcomes are preliminary as the project is ongoing. The number of pregnancy-related VTE cases identified exceeds the number found in previous studies. This will give more power to detect potential differences between SCT and HbAA. As the project continues, next steps will be to 1) Continue data collection and chart reviews to identify more cases; 2) Match each case with 2-3 controls without VTE; 3) Determine SCT prevalence among controls; 4) Perform logistical regression to determine association of VTE with SCT.

Supported by: The UConn School of Medicine Summer Research Fellowship and American Society of Hematology

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Case Report: Augmented Visualization Surgical Microscope-assisted Microvascular Decompression for Hemifacial Spasm

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Microvascular decompression (MVD) is a curative treatment for primary hemifacial spasm, a condition characterized by painful, involuntary facial muscle contractions caused by compression of the facial nerve by a vascular loop. In MVD, material such as Teflon is placed between the vascular loop and facial nerve to relieve the compression. The surgical success rate is high with about 91.1% of patients symptom-free in the first year of surgery. Although the risk of complications with the procedure is low, potentially debilitating and fatal complications have been reported, including stroke which can be caused by excessive compression of the vascular loop at the time of decompression. Due to this potentially fatal complication, a technique to confirm vascular integrity during and after decompression is indicated. Recently, an augmented reality surgical microscope was approved by the FDA that utilizes *in vivo* fluorescence technology to monitor vascular patency intraoperatively². We describe the first use of this technology during microvascular decompression of the facial nerve in a 60 year-old male patient with a history of primary right hemifacial spasm resistant to other treatment. This novel approach allows for intraoperative confirmation of vascular integrity and allows for modification of vascular decompression if compromise is identified. We believe this approach adds for enhanced safety and precision for microvascular decompression.

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Alcohol Consumption and its Impact on Risk Behaviors and Self Perception/Stigma

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Background/Objectives: Heavy alcohol consumption is an important risk factor for many health conditions. Uganda, in particular, has significantly high rates of excess alcohol consumption/alcoholism. 9.8% of the adult population has an alcohol use related disorder.¹ Alcohol abuse in this region is a highly important public health issue that requires further research. The purpose of the study was to investigate and detail the alcohol consumption among the population and identify any relationships it might have with not only risk behaviors, but also negative self-perceptions and stigmas that come along with excess alcohol use in rural Uganda.

Methods: The study consisted of 100 interviews of men (18-30 yo) in Kisoro District, Uganda. The interview consisted of general demographics, alcohol consumption habits, and risk related behavior related questions.

Results: Data was collected and entered into Microsoft Excel. Initial results showed a mean AUDIT score of 19.02, which qualifies as harmful/high risk alcohol use. 62% of participants surveyed fell into either the categories of harmful alcohol consumption (18%) or alcohol dependence (44%). 32% qualify for what is considered risky or hazardous alcohol consumption. No correlation was found between demographic factors and AUDIT score, thus indicating that high rates of alcohol abuse were not defined by demographic factors. There appeared to be a trend that those with higher AUDIT scores were more likely to drink for emotional regulation.

Conclusions: Initial results confirm that alcohol abuse is highly prevalent in this population. A large portion scored in the upper risk tiers of AUDIT and a number of participants were exhibiting risky alcohol consumption behaviors. Further analysis will involve risk behaviors and alcohol consumption habits, including social vs isolated consumption, "light vs heavy" consumption, and other associated factors.

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Assessment of Myocardial Deformation in Adult Patients with Type 2 Diabetes Mellitus

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Background/Objectives: Diabetic cardiomyopathy is a disorder of the myocardium in diabetics with absence of coronary artery disease (CAD). It is characterized by left ventricular (LV) hypertrophy and decreased LV compliance leading to heart failure. There is a latent phase, during which the disease progresses but the patient is asymptomatic.¹ Echocardiography has become an increasingly critical diagnostic tool. Myocardial strain analysis has been shown to detect subclinical LV systolic dysfunction before symptom onset^{1,2}. Strain is affected by local myocardial contractility, pre-load, and after-load². We hypothesize diabetic patients will demonstrate an impairment in LV systolic function as measured by strain.

Methods: A retrospective case-control study was performed evaluating diabetic patients with complications (Diabetic Neuropathy or Retinopathy per ICD coding) with echocardiograms in the past four years compared to patients without diabetes as control group. Patients with known CAD, Congestive Heart Failure, and moderate-severe Valvular Heart Disease were excluded. Data was analyzed using Phillips QStation 3.8.5. Statistical analysis using Independent T-test was performed.

Results: Baseline characteristics and myocardial strain analysis were collected in 45 patients (30 in the Diabetes group and 15 in the Control group). In the diabetes group, the mean age was 62, the mean Hemoglobin A1C was 7.5%, 59.3% were females, 20% had Uncontrolled Hypertension (HTN), and one patient had Advanced Chronic Kidney Disease (CKD). In the Control group, the mean age was 66, 60% were females and none had Diabetes, HTN or CKD. The mean LV global longitudinal strain (GLS) was significantly lower in the Diabetes group compared to the Control group (16.7% vs. 19.6%) (P<0.05). Similarly, Left atrial Strain was lower in the Diabetes group than in the Control group (29.4% vs. 35.8%) (P<0.05).

Conclusions: Type 2 Diabetes Mellitus may be associated with subclinical LV systolic dysfunction and reduced LA performance as measured by LV-GLS and LA strain, respectively.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Baby Boxes In Uganda: A Pilot Intervention Targeting Infant Mortality

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Background/Objectives: Despite global and local intervention, mortality of children under five years old in sub-Saharan Africa account for half of global child deaths¹. Annually, 26% of deaths among Ugandan children in this age range occur within the first month of life² and many can be attributed to preventable causes, such as malaria or accidents³. This study aimed to address these common causes of infant mortality through implementation of a pilot baby box intervention at Clare Nsenga Foundation Clinic (CNF) in the rural Kisoro district of Uganda.

Methods: 40 wooden boxes were constructed on-site by a local carpenter and equipped with a fitted foam mattress, mosquito net, knit blanket and clothing donations. Women who had recently delivered at CNF and/or whose babies were 3 months or under were recruited in local villages. Midwives from the clinic delivered a short set of verbal instructions on how to use the box and safe sleeping practices for newborns. A home visit was conducted two weeks after box distribution and a survey was administered to assess use and likeability of boxes.

Results: In 2 months, 31 boxes were distributed. 100% (n=30) of women reported liking and using the box. At baseline, 96.7% (n=29) of participants reported co-sleeping with their baby every night, whereas only 16.7% (n=5) of women continued to co-sleep every night after receiving a box. 93.3% (n=28) of women reported that their baby slept in the box during naps and 100% (n=5) of women who never used the box at night reported that they instead “always” use it for the baby to nap in during the day.

Conclusions: Baby boxes were found to be well-liked and used in the rural Kisoro district. Although the boxes were originally intended to be used at night to reduce co-sleeping and increase deployment of mosquito netting, many women reported that they used the box during the day for the baby to nap in while completing chores around the house. These results indicate an unforeseen use for baby boxes in a resource poor environment. Based on the success of this pilot, this intervention should be further investigated to assess long term benefits and sustainability of a baby box program in rural Uganda.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Parental Attitudes Toward Sedation And The Influence On A Child's Behavior In The Dental Operatory

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Objective: The greatest influences on oral health in children are parental knowledge and parental attitudes toward dentistry(1-3). The objective of this study was to evaluate parental attitudes toward pediatric sedation and behavioral management, parental dental anxiety, and attitudes and beliefs about dentistry to assess the degree to which these factors associated with the child's behavior in the dental operatory. It was hypothesized that: the attitudes of parents toward sedation practices would be affected by their anxiety and would influence their child's behavior, such that more fearful parents would have children who are more fearful and less cooperative.

Methods: Parents of children ranging in age from 4-13 years receiving dental care at a community pediatric dental clinic (N=57) were administered questionnaires asking about child and parent background characteristics, parents' attitudes toward child behavior management, and parent's experiences with dentistry. In addition, the children were rated by providing dentists on level of cooperativeness during dental treatment. Acceptability ratings of various management techniques were compared using one-way analysis of variance. Child cooperativeness ratings were analyzed using multiple regression, with parent dental fear ratings and attitudes used as predictors.

Results: As expected, parents scored as more acceptable those management practices that were least restrictive or invasive, with the most acceptable being Tell-Show-Do and N2O sedation. Results of linear regression indicated that none of the predictors tested accounted for significant variance in child cooperativeness ratings, possibly due to the restricted range of those scores.

Conclusions: As in previous research, parents in this study found most acceptable those behavioral management practices that were the least invasive or restrictive. A strong conclusion could not be made about an association between parental dental anxiety, attitudes toward dental care and attitudes toward dental procedures and the child's behavior in the operatory, possibly because most of the children were rated by their dentists as being quite cooperative.

Future Directions: Despite null findings here, research on the influence of parental attitudes on child behavior in the dental operatory may shed light on the development of dental fear in children.

Supported by: *The UConn School of Dental Medicine Summer Research Fellowship*

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The Effect of Repeated Non-Surgical Periodontal Intervention on Clinical Periodontal Parameters in End-Stage Renal Disease (ESRD) Patients Receiving Dialysis

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Objective: There are approximately 37 million Americans currently living with chronic kidney disease (CKD) or end stage renal disease (ESRD)^{1,2}. Although this represents 15% of the adult population, the American Dental Association (ADA) does not have a distinct set of recommendations for oral health maintenance in ESRD patients^{1,2}. This is particularly notable because this vulnerable population is 25% less likely than non-CKD patients to receive dental care³. The effect of short term non-surgical periodontal intervention has been shown to improve clinical periodontal parameters in CKD patients; however, the effect of sustained, long term intervention is not yet known in this population⁴. The study aims to determine if there is a difference in periodontal parameters between the standard-of-care and the non-surgical periodontal therapy groups of ESRD patients receiving hemodialysis and peritoneal dialysis⁵. Probing depth (PD), bleeding on probing (BOP), and plaque score (PS) are measured as clinical periodontal parameters⁵.

Methods: ESRD adult patient with periodontitis were included in the study. Block randomization was utilized to separate participants into standard-of-care and non-surgical periodontal intervention therapy groups by race, gender, and age⁵. Periodontal parameters were measured before the intervention was received at each visit over a 6-month period of time⁵. The data was analyzed using dependent T-testing within the treatment groups, while independent T-testing was utilized to compare change between the test and standard-of-care arms. Significant was determined at $p \leq 0.05$.

Results: Within our population of 42 ESRD patients, statistically significant changes in periodontal parameters were found between the standard-of-care and repeated non-surgical periodontal therapy groups. Randomization balanced confounding variables, such as current smoking (test $n=3$; control $n=0$) and diabetes status (test $n=6$; control $n=10$), which contribute to periodontitis. There was a statistically significant change in percentage of sites with $PD \geq 5\text{mm}$ ($\Delta\%PD \geq 5\text{mm}$) between the treatment groups. The test $\Delta\%PD = -17.21\%$ while the control $\Delta\%PD = 4.53\%$, $p = 2.58 \times 10^{-4}$. There was not a statistically significant change in the percentage of BOP sites ($\Delta\%BOP$) between groups, $p = 0.958$. A statistically significant reduction in PS ($\Delta\%PS$) was also found at $p = 0.003$. The test $\Delta\%PS = -4.39\%$ while the control $\Delta\%PS = 1.32\%$.

Conclusions: Within our limited sample size, repeated non-surgical periodontal therapy did make a statistically significant difference in periodontal parameters PD and PS. This verifies the hypothesis that repeated and regular non-surgical periodontal intervention will improve clinical periodontal parameters in an ESRD population. If these results are repeatable and determined to be clinically significant, then the findings have the potential to indicate a need for a change in the standard of care ESRD patients.

Future Directions: Systemic inflammation will be compared to clinical periodontal parameters using levels C-reactive protein (CRP) and interleukin 6 (IL-6) from serum that was collected from each participant prior to receiving treatment⁵.

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Incidence of Ophthalmic Injuries in the National Basketball Association Resulting in Removal from Active Rosters over a 21 Month Period

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Background/Objectives: Basketball is the second leading cause of sports related eye injuries in the US¹. The incidence of eye-related injuries in the National Basketball Association (NBA) has not been reported since 2010². Our objective was to determine the incidence of ophthalmic injuries in the NBA that resulted in the players being removed from their respective teams' active rosters.

Methods: We conducted a retrospective study evaluating games missed due to injury in the NBA over a 21-month period from October 26th, 2015 to June 19th, 2017. Data were collected from ProSportsTransactions.com by searching NBA transactions of missed games due to injuries. Ophthalmic and ophthalmic-related injuries were identified from the total set of injuries that caused games to be missed during that period and analyzed. Our primary study outcome was the incidence of ophthalmic and ophthalmic-related injuries per 1,000 game exposures. Another study outcome measured is the eye injury rate per 1,000 NBA games.

Results: From a total of 2,625 games played between October 26th, 2015 to June 19th, 2017, 18 eye injuries were identified. The incidence of ophthalmic and ophthalmic-related injuries that caused players to be removed from their teams' respective rosters is 6.86 (95% CI 3.70 - 10.0) ophthalmic injuries per 1,000 games and a rate of 0.281 (95% CI 0.098 - 0.465) ophthalmic injuries per 1,000 game exposures.

Conclusions: Our findings indicate a reduction in ophthalmic injury in the NBA compared to a 1992-3 study which reported a rate of 1.44 per 1,000 game exposures and a 1988-2005 study which reported a rate of 0.7 per 1,000 game exposures. The reduction in ophthalmic injuries per game exposure could be a result of rule changes that prioritize player safety.

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Effects of Acute Cannabis Administration on Psychomotor Function and Subjective Ratings of Intoxication

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Background/Objectives: Cannabis is the most widely used illicit drug in the world, and despite recent increases in rates of legalization, there are still questions regarding implementation of effective transportation policy regarding marijuana intoxication. Previous studies show psychomotor function is both necessary for driving, and also affected by acute cannabis administration. The goal of this study is to better understand how acute administration of cannabis affects psychomotor function, and additionally, how this effect correlates with individuals' subjective ratings of highness, sleepiness, and driving impairment.

Methods: 36 frequent and occasional cannabis users aged 18-40 were recruited from the community. On three separate occasions, subjects were administered one of three dose conditions: low THC, high THC, and placebo, in a random order. Smoked cannabis was administered through a vaporizer. On each day, subjects completed a series of driving simulations, cognitive function tasks, and subjective ratings of impairment and intoxication. This analysis looks at the Critical Tracking Task (CTT), and the Verbal Analog Scale (VAS). In the CTT task, the participant uses compensatory joystick movements to nullify an error signal that is represented as deviation of a cursor from the midpoint of a horizontal axis. The variable of interest is the frequency at which the participant's response is not quick enough to null the error. The VAS is a subjective rating scale administered several times throughout the day in which the participant rates their highness, sleepiness, and driving impairment on a scale of 0-100.

Results: No significant difference was found in CTT mean lambda scores between dose conditions, but within the high dose condition, mean lambda score significantly increases over time. The VAS was used to determine if there was a correlation between subjective ratings of highness, sleepiness, or driving impairment and CTT mean lambda. A significant positive correlation ($r=0.31$, $t=2.17$, $p=0.036$) was found between sleepiness rating and mean lambda score. More specifically, this correlation was only found significant within time frame of 6-7 hours.

Conclusions: There is no significant difference in mean lambda scores between the three treatment conditions. However, within the high-dose treatment condition only, the mean lambda scores increase over time, indicating dose-effects differ between the three treatment groups. Since previous literature suggests that peak effects of cannabis occur within 1 hour after administration, it can be inferred that within 1 hour of cannabis administration, differences in CTT performance between the three dose conditions may be present. Additionally, within the high dose condition, awareness of sleepiness correlates with better performance on CTT after 6 hours of dosing.

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Description of Patients with Substance Use Disorders Residing in Skilled Nursing Facilities in Central Connecticut

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Background/Objectives: For reasons including the opioid epidemic and more widespread substance use across all ages, the prevalence of individuals who meet preadmission criteria for skilled nursing facility (SNF)-level care *and* who have substance use disorders (SUDs) is growing. However, little is known about this population. We sought to characterize a sample of residents with SUDs in two SNFs in central Connecticut.

Methods: Retrospective chart review using admission data from Preadmission Screening and Resident Review (PASRR) and Minimum Data Set (MDS) forms was conducted for residents admitted to Chelsea Place Care Center and Trinity Hill Care Center, two SNFs in Hartford, CT, between June 1, 2018, and May 31, 2019. Residents were included in the study if they had a recorded SUD on admission PASRR. Variables measured included demographic information, depression, active diagnoses, health conditions, and medications. Participation in SNF-provided SUD counseling was also recorded. Descriptive statistics were used to describe the study population.

Results: There were 181 residents admitted to the SNFs with an SUD during this time period, and all but one were admitted following an acute hospitalization. Residents had an average age of 49.1 ± 12.2 (Range 21-79 years), were 62% male, and were racially diverse: 46% Caucasian, 21% Hispanic, 15% Black, and 18% with missing data for race. The majority (69%) had never been married. Upon facility admission, 35% of residents had anxiety, 27% had depression, 14% had bipolar disorder, 10% had PTSD, and 9% had schizophrenia. Average depressive symptoms score 4.9 ± 5.4 . 33% of residents had an opioid use disorder, 28% had an unspecified psychoactive substance use disorder, 25% had an alcohol use disorder, and 15% had a cocaine use disorder. 23% of patients had viral hepatitis, either acute or chronic, upon admission, making this the most frequent medical diagnosis among this population.

Conclusions: Analyzing admission data for SNF patients with SUDs provides insights into characterization of the population. These individuals constitute a diverse, relatively young group with a high prevalence of psychiatric comorbidities. Improved understanding of this unique and growing subset of the SNF population may help to optimize their treatment.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Pressure Distribution of Elliptical and Spherical Heads in Total Shoulder Arthroplasty

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Background: Total shoulder arthroplasty is the standard treatment option for patients with advanced glenohumeral osteoarthritis. Until recently, the design of the prosthetic humeral head has been a spherical shape. However, recently, several studies shown that the spherical head shape does not mimic the native humeral head and rather an elliptical shaped prosthetic head more closely mimics the native function of the shoulder [1,2]. In a biomechanical study, elliptical prosthetic heads were found to have significantly increased range of motion and better glenohumeral joint kinematics compared to spherical head prosthetics.[3] The purpose of this study is to compare the contact pressure, peak pressure and contact area of spherical shaped prosthetic heads compared to elliptical shaped prosthetic heads in cadaveric shoulders.

Methods: Seven dissected cadaveric shoulders with rotator cuff muscles still intact were used to test if there was a difference in using a spherical head or an elliptical head for a total shoulder arthroplasty. Contact pressure, peak pressure and contact area were measured using a TeckScan (TeckScan, inc) that was inserted between the prosthetic head and the anterior capsule. The shoulder simulator controlled for the forces and movements. Each shoulder was tested in 9 conditions: Native, Spherical head (matched-fit) and Elliptical head (matched-fit) at rest, 30 degrees 45 degrees and 60 degrees of abduction, with an arch of 100 degrees (50 degrees internal rotation and 50 degrees external rotation).

Results: The results show there was a significant difference between the elliptical head and spherical head. Contact pressure was higher in the spherical head at 30 degrees external rotation and 15 degrees static neutral rotation ($p < 0.05$). Peak pressure was greater in the spherical head compared to the elliptical head at 0, 15, 30 and 45 degrees external rotation and 15 degrees static neutral rotation ($p < 0.05$).

Conclusion: The elliptical head show lower peak pressure in external rotation compared to the spherical head.

Supported by: UConn School of Medicine Summer Research Fellowship.

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Prevalence and Understanding of Sickle Cell Disease in Rorya District, Tanzania

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Background: Sickle cell disease (SCD) remains a significant cause of early childhood mortality in Sub-Saharan Africa, with Tanzania estimated to have the third highest number of SCD births/year. Currently, there is no universal SCD screening program in Tanzania. It has been predicted that the sickle gene is highly prevalent in the northwest region due to the proximity of Lake Victoria and high incidence of malaria in the area. This study aimed to determine the prevalence of SCD and sickle cell trait (SCT), as well as to evaluate understanding of SCD in Rorya District, a region of northwestern Tanzania.

Methods: This was a cross-sectional prevalence study. Children (47.9% male, 50.0% female, 2.1% sex not recorded, average age = 12.1 months, SD = 14.6) were recruited from health clinics and hospitals within Rorya District. Inclusion criteria consisted of children five years of age and younger living in Rorya District with parents who are proficient in Kiswahili and able to provide informed consent. Verbal informed consent was obtained from the participants' parent/guardian at the time of enrollment. Participants were screened using HemoTypeSC™, a rapid diagnostic test. In addition, sociodemographic data, family history, and a brief knowledge assessment of SCD were collected.

Results: A total of 1008 children were enrolled from June 2019 to August 2019. 2.7% (27/1008) had SCD, 25.6% had SCT (258/1008), and 71.2% (718/1008) were unaffected. 0.5% (5/1008) were excluded due to an invalid test result or recent blood transfusion. Furthermore, a limited understanding of SCD was demonstrated amongst parents/guardians. 60.8% reported having heard of SCD prior to enrollment. Only 28.1% agreed that SCD occurs more often in African people. The majority of responses were uncertain with regards to issues of genetic inheritance, clinical presentation, and disease management. Potential limitations include self-selection bias or recruitment bias from clinical settings.

Conclusions: The prevalence of SCD and SCT in Rorya District is one of the highest in the world, signifying a need for universal screening and improved education in the district. Data from this study will be used to inform clinical practices, justify the establishment of SCD-specific clinics, and highlight the need for improved screening efforts in this region.

Supported by: The UConn School of Medicine Summer Research Fellowship

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PLXNA3 (Plexin A3) Variants Cause a Spectrum of Neurodevelopmental Disorders

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Background/Objectives: Genetic testing is providing molecular diagnoses for clinical disorders. Genes not yet connected to clinical disorders due to lack of research are categorized as “variants of uncertain significance” (VUS). Mutations in the plexinA3 gene (PLXNA3), a prenatally-expressed signaling gene involved in axonal outgrowth, are currently identified as VUS.^{1,2,3} The goal of this study is to describe the neurological and neurodevelopmental phenotypes of boys with *PLXNA3* variants.

Methods: The proband in this study is a 15-year-old boy with longstanding severe intellectual disabilities (ID), who has a hemizygous *PLXNA3* variant identified on a trio GeneDx Autism/ID Xpanded Panel. This study used a global data exchange platform, GeneMatcher, to identify and recruit other physicians caring for boys with hemizygous *PLXNA3* variants (“*PLXNA3* patients”). In this case-series, physicians completed questionnaires about the clinical features of their *PLXNA3* patients. *In silico* gene expression analysis was completed using Polyphen, Provean/Sift, and Mutation Taster to determine the likelihood of pathogenicity for each *PLXNA3* variant. Descriptive statistics were used to describe genotype/phenotype findings in an ongoing study.

Results: Worldwide, GeneMatcher identified ~70 *PLXNA3* patients, of which approximately half had documented maternal inheritance. We studied five unrelated male *PLXNA3* patients (mean age, 9.8 [range 2-15] years), who all had a diagnosis of ID and autism, ranging from mild to severe. Four patients (80%) had fine-motor dyspraxia; three patients (60%) had variable behavioral disorders including hyperkinesia, attentional deficits, and aggressive behaviors. Three patients (60%) were treated for epilepsy. All five *PLXNA3* patients showed “probably damaging/disease causing” variant pathogenicity in one or more gene expression profiles.

Conclusions: *PLXNA3* has been identified as a possible risk factor for neurodevelopmental disorders.^{4,5} This preliminary clinical study is the first to describe *PLXNA3*-related neurodevelopmental disorders in boys. Additional clinical and neurobiological studies are needed to determine the significance of “plexinopathies” in the developing brain.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Evaluation of Social Media Presence of Dermatology Residency Programs

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Background/Objectives: Previous work by Xie et al evaluated the social media presence of otolaryngology residency programs and found that the overall presence was low and represented an opportunity for programs to improve communication and outreach efforts with the communities they serve (Xie et al., 2018). Since then, no other works have been published that describe the social media presence of other specialties' residency programs. This data is publicly available and searchable and could highlight differences in specialties' approaches to social media and communication platforms for interacting with the general public.

In this work, we evaluate the social media presence of dermatology residency programs ranked 1 to 100 by Doximity's residency navigator reputation rankings (Doximity, 2019).

Methods: Social media presence for each program was determined by going to the program's website and seeing any links to social media accounts specific for the program (i.e. general social media accounts for the program's school of medicine or hospital were not included) and by searching for such accounts with a Google search. For every program with a Facebook account, total number of followers and likes were collected, for every program with a Twitter account, total number of tweets, followers, accounts following, and likes were collected, and for every program with an Instagram account, total number of followers and posts were collected. Other social media accounts such as Youtube accounts were also collected as data points.

Results: The total number of programs in this study with at least one social media account found was 37 out of the 100 programs included. When comparing the top 20 ranked programs (M=1.20 social media accounts per program, SD=1.06) to the programs ranked 21-100 (M=0.43 social media accounts/program, SD=0.73), the top 20 programs had 0.78 more social media accounts per program ($t(98)=3.87$, $p<0.0002$). The top 20 ranked programs had a combined total Facebook engagement (defined as the sum of the programs' number of likes and followers) and combined total Twitter engagement (defined as the sum of the programs' number of tweets, accounts following, followers, and likes) of 3,876 and 6,915 respectively compared to programs ranked 21-100 having combined total Facebook and total Twitter engagement of 14,869 and 48,116 respectively. The top 20 ranked programs therefore had a combined 4.3% higher Facebook engagement per program compared to 21-100 ranked programs while the 21-100 ranked programs had 74% higher Twitter engagement per program than the top 20 ranked programs.

Conclusions: In this work we present detailed analysis of the social media presence of all programs ranked 1-100 by Doximity rankings and conclude that social media represents an opportunity for dermatology residency programs, particularly those ranked lower, to provide a low cost platform to communicate with medical students and the general public.

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Community Engagement, Community Connectedness, and Social Cohesion in HIV/STI Testing Behavior Among MSM in China: A Factor Analysis

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Background/Objectives: Sexually transmitted infections (STIs) including gonorrhea and chlamydia (GC/CT) and human immunodeficiency virus (HIV) remain important public health issues. These diseases disproportionately affect men who have sex with men (MSM) at higher rates.¹ Easily accessible MSM-friendly testing services have been shown to contribute to increased testing.² Community factors have been shown to be associated with positive sexual health outcomes and sexual health seeking behaviors among sexual minorities.³ In China, there are currently no screening guidelines or widespread programs supporting GC/CT testing.⁴ Among Chinese MSM, prevalence remains high while testing rates remain low.⁶ There is still a gap in understanding the latent structures of community factors and their linkage to STI testing behavior among Chinese MSM.

Methods: Community factor items were collected in a randomized controlled trial investigating chlamydia and gonorrhea test uptake among 301 MSM comparing a pay-it-forward intervention to pay-what-you-want and standard of care. Exploratory factor analysis was performed on the community factor items. A principal component extraction and an oblique promax rotation was performed to identify latent factor structures in the community items. The optimal number of factors was determined using Kaiser's criterion and scree test. Univariate and multivariable logistic regressions were performed to identify correlations between community factors and the outcomes, including GC/GT test uptake and HIV testing frequency.

Results: Exploratory factor analysis yielded a 19-item scale with six latent factors. Identification in the community, collective agency, and social cohesion were associated with increased GC/CT testing uptake. Active community support was associated with increased HIV testing frequency.

Conclusions: The validity and reliability of the community scale was assessed in the exploratory factor analysis. These community factors were associated with HIV and STI testing behavior. Exploring the relationship between community factors and STI/HIV can aid in targeting interventions to increase testing among MSM in China.

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The Interaction between Rotator Cuff Tendon and Subacromial Bursa in Culture

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Background/Objectives: The rotator cuff tendon and subacromial bursa are in close proximity within the shoulder and therefore the interaction between the tissues may influence shoulder pathology. The subacromial bursa is a source of cytokines and metalloproteases in rotator cuff pathology.^{1,2} The subacromial bursa was also found to be a source of mesenchymal stem cells which can aid in healing of tendon repairs.^{3,4} The purpose of this study was to examine the effects of the interaction between the tissues.

Methods: Rotator cuff tendon and subacromial bursa samples were obtained from 6 patients undergoing rotator cuff repair surgery. Samples were placed in co-culture plates containing a 0.4µm filter insert. Group 1 contained only tendon. Group 2 contained only bursa. Group 3 contained both tendon and bursa. Samples were grown in culture for 21 days. Quantitative polymerase chain reaction was performed on tissues on day 0 and day 21. Genes analyzed include Tenascin C, Decorin, Collagen III, Scleraxis, Collagen I, Alkaline Phosphatase, Sox 9, and FABP4.

Results: Expression of almost all markers were statistically significantly increased at day 21 compared with day 0 in both tissues cultured alone and co-cultured tissues. There was a statistically significant increase in expression of decorin and collagen III and statistically significant decrease in expression of scleraxis and collagen I in tendon cultured alone vs. co-cultured tendon. There was a statistically significant increase in expression in tenascin- c, decorin, and scleraxis and a statistically significant decrease in expression of collagen I in bursa cultured alone vs. co-cultured bursa.

Conclusions: It can be concluded that there is a difference in gene expression when tissues are cultured together compared to when they are cultured alone which signifies an interaction between the two tissues. This applies clinically in deciding whether to remove or leave bursa tissue during rotator cuff tendon repair.

Supported by: The Uconn School of Medicine Summer Research Fellowship

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Survey of Mental Health Status in Vietnamese Men Who Have Sex with Men

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Background/Objectives: There are an estimated 200,000 men who have sex with men (MSM) in Vietnam¹, and this population is at greater risk for developing mental health conditions due to many intersecting factors, such as internalized homophobia, lack of social support, stigma, and prejudice²⁻⁴. Currently, the WHO estimates a 4% prevalence of depression and a 2.2% prevalence of anxiety disorders in Vietnam⁵. Past studies in LGBT university students in SE Asia and male sex workers in Vietnam show that the rates of mental health disorders in these high-risk populations are much higher than those in the overall population^{6,7}, which indicates a need to investigate mental health status in the men who have sex men population. The objective of this study is to assess the current status of mental health in the Vietnamese MSM population, as well as explore the availability and barriers to access of mental health services.

Methods: This study gathered data on the current psychosocial circumstances, mental health needs, perception on mental health and mental health services, and risky sexual behaviors in 301 Vietnamese men who have sex with men using a quantitative online survey.

Results: Results show a high prevalence of severe and extremely severe stress (59.1%), depression (72.8%), and anxiety (85.7%), high levels of concern for mental health disorders, and a high prevalence of diagnosed mental health disorders (51.2%). 23.6% of respondents reported self-harming behaviors and 10% of respondents reported suicide attempt within the last year.

Conclusions: Results show high levels of mental distress and high prevalence of diagnosed mental health disorders. Past studies have shown that mental health is linked to risk factors for other health conditions, such as risky sexual behavior⁸, suggesting that successful mental health interventions could have a wide range of implications for MSM health.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Prophylactic Antibiotic Prescription Practices by Dentists in an Academic Outpatient Setting

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Objective: A substantial proportion of antibiotic prescriptions in the United States are written by dentists for the treatment of odontogenic infections and for peri-procedural prophylaxis against infection. There is limited research available describing antibiotic prescribing by dentists in the outpatient setting, and the prescribing of antibiotics for prophylaxis is particularly limited. The goal of this study is to describe prophylactic antibiotic prescribing in outpatient dentistry practice in order to identify potential opportunities to improve prescribing practices.

Methods: This project was a retrospective cohort study analyzing antibiotic prescriptions by dentists from the University of Connecticut School of Dental Medicine outpatient clinics. All antibiotic prescriptions written during the four month study period were manually reviewed. Data collected describing antibiotics selection, indication, treatment duration, patient comorbidities, and dental interventions at the time of the prescription was analyzed for each prescription event. Antibiotic prescriptions in the absence of symptoms or examination findings suggestive of active infection were identified as prophylaxis.

Results: Of 860 prescriptions reviewed, 415 (48.3 %) were designated as antibiotics for treatment cases while 235 (27.3%) were prescribed for prophylaxis and for 210 (24.4%) the indication was uncertain based on available documentation or documentation was unavailable. Multi-day duration prescriptions for prophylaxis (n = 177, 75.3%) were more frequent than single dose prescriptions for prophylaxis (n = 58, 24.7%) (p < 0.05). Amoxicillin was more frequently prescribed among single-dose prophylaxis compared to multi-dose prophylaxis (96.5% vs. 77.98%, p < 0.05) whereas clindamycin was more frequently prescribed among multi-day prescriptions (13.6% vs. 3.5%, p < 0.05). Single-dose prophylaxis was most commonly prescribed prior to an implant placement (50.00%) and prior to an extraction (15.52%) while multi-day prescriptions followed a similar pattern and were most commonly prescribed following extractions (37.29%) and implant placements (27.68 %). Five patients (8.62%) getting single-dose prophylaxis and 37 multi-dose patients (20.90%) reported an allergy to antibiotics with penicillin allergies being reported for 2 patients (3.45%) in single-dose prophylaxis cases and 18 patients (10.17%) in multi-dose cases.

Conclusions: In outpatient dentistry, a substantial proportion of all antibiotics were prescribed for prophylaxis with multi-day prophylaxis in the setting of dental interventions, typically following extractions and implant placement, more frequently prescribed than single-dose prophylaxis. In the absence of clearly defined prophylaxis guidelines, the role and impact of antibiotic prescribing for multi-day prophylaxis warrants further evaluation. Antibiotic choice for single dose prophylaxis was consistent with published guidelines, though the frequency of clindamycin prescription in multiple dose prophylaxis also warrants further investigation.

Future Directions: The variation in prophylactic prescribing practices may support an opportunity to develop an antibiotic stewardship educational module that can be implemented in an outpatient dental practice setting, and to study the impact of different prophylactic antibiotic prescribing strategies used in clinical dental practice.

Support: *This project was done without any grants or financial support.*

Cutaneous Graft-Versus-Host Disease Treatment Comparison Retrospective Review

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Background/Objectives: Graft-versus-host disease (GVHD) is a complication experienced by 44% of transplant patients and may deleteriously affect quality of life and organ function.¹ There is a gap in the literature and lack of clinical consensus as to which pharmaceutical approach is best suited for cutaneous GVHD reduction: calcineurin inhibitors (CNIs) or steroids. We observed the clinical outcomes, including changes in cutaneous GVHD severity grading and specific cutaneous symptoms, of patients being treated for cutaneous GVHD.

Methods: Hartford Hospital patient files were analyzed in a retrospective chart review, including patients with ICD-coded GVHD and concurrent treatment with CNIs, steroids, or both treatments. Cutaneous symptoms and NIH cutaneous GVHD grading were collected at the dates of GVHD diagnosis, treatment initiation and completion, and most recent follow up visit.² Cutaneous symptoms were assessed by changes in rash presence, which is the first GVHD indicator in 80% of patients, and by the presence of multiple cutaneous symptoms.³ Descriptive statistics with ANOVA were performed to summarize changes in severity grading and symptoms.

Results: 22 of 75 initial patients fit the outlined criteria: 9 were treated with steroids, 5 with CNIs, and 8 with both therapeutic categories. Average reduction in skin grading for the steroid, CNI, and dual treatment were 0.17 ± 0.33 , 1.8 ± 0.45 , and 0.71 ± 0.49 , respectively, and so greatest for CNIs ($p=0.004$, ANOVA). Rates of rash and multiple cutaneous symptoms were reduced by 10.7% for steroids, 40.0% for CNIs, and 42.4% for dual treatment, although not found statistically different by ANOVA ($p=0.422$).

Conclusions: Our data demonstrates that treatment of cutaneous GVHD with CNIs alone or steroid-CNI combinations are associated with greater decreases in GVHD severity than steroid treatment alone. We recommend the use of CNIs, first alone and then with the addition of steroids to mini adverse effects. Ultimately, future studies be conducted with higher patient volumes.

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Provider Experience; Implementing a Diabetes Screening into our Dental Exams

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Objective: To assess provider experience on implementing a diabetes screening protocol into the dental clinics at UConn School of Dental Medicine. Based on specific interactions and higher experience level, the hypothesis is the provider will obtain greater success rates in implementing the diabetes screening. The goal of this study is to solicit feedback and recommendations to qualitatively evaluate and improve the workflow and other modifications as needed.

Methods: Semi-structured interviews were conducted with 26 AEGD residents who piloted the diabetes screening protocol. Responses were qualitatively analyzed into common themes for analysis by resident year and by number of HbA1c tests completed. The questions asked during the interviews gauged providers thoughts and insights into implementing a diabetes screening protocol, as well as their experience with the protocol, barriers faced, and their perception of their patient's opinions on the protocol.

Results: The biggest barrier residents faced when implementing the diabetes protocol was a lack of time to complete the protocol alongside standard care and scheduled procedure tasks. However, providers were very accepting of the protocol while seeing great positive impacts it would make to the community, as well as reporting a strong perceived acceptance within the patient population. 85% (n=22) of providers thought the protocol had a strong positive impact, while 8% (n=2) were unsure and wanted to see more data. 100% of second year residents reported having perceived a majority of their patient's opinions to be accepting of the protocol compared to 71% of first year residents.

Conclusion: Providers will get better acceptance rates if they put in the effort and are enthusiastic about the protocol themselves. The study results are significant to improve provider experience with implementing a diabetes screening to improve public health efforts.

Future Directions: Implementation of the diabetes screening protocol into student clinics here at UConn SDM, incorporating a notification system in axiUm to remind providers to follow up with their patients on referrals sent out, as well as other recommendations to the workflow given by current residents.

Supported by: *The UConn School of Dental Medicine Summer Research Fellowship*

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Influence of Posterior Staphyloma on Postoperative Astigmatism after Cataract Extraction in Highly Myopic Eyes

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Background/Objectives: There is great potential for correcting a patient's astigmatism during cataract surgery by replacing the natural lens with the appropriate toric intraocular lens and/or through other procedures. However, eyes with a condition known as posterior staphyloma (PS) may have residual refractive astigmatism even after standard astigmatic corrections account for the irregularly shaped cornea. PS is defined as an outpouching of a portion of the posterior sclera of the eye, which associated with highly myopic eyes.¹ The irregular curvature of the retina in eyes with PS may contribute to astigmatism in addition to that which is attributable to other refractive elements of the eye (anterior cornea, posterior cornea, and lens).²⁻⁴ Our aim is to determine this contribution.

Methods: This retrospective study included 74 highly myopic eyes (axial length ≥ 25.0 mm) that underwent cataract-implant surgery from 2012-2019 at the Mackool Eye Institute in Astoria, NY. 37 eyes had PS as confirmed by macular OCT, and 37 eyes did not have PS. For each eye, vector arithmetic was used to subtract the measured anterior corneal and lens astigmatic components from the total postoperative refractive astigmatism.⁵ The resulting "net astigmatism" values were compared between the two groups using an independent t-test.

Results: Calculated net astigmatism power for PS eyes ($M = 0.53$ D) compared to non-PS eyes ($M = 0.56$ D) had a similar distribution and did not show evidence of a significant difference between the groups ($p = 0.71$). Considering the 10 eyes from each group with net astigmatism power ≥ 0.75 D, 50% of PS eyes had a net astigmatism steep axis oriented horizontally compared to 90% of non-PS eyes.

Conclusions: Although the data do not suggest an astigmatic difference between PS and non-PS eyes, our lack of posterior corneal astigmatism measurements is an important limitation that could explain the observed pattern in net astigmatism axes. We plan to obtain posterior corneal measurements moving forward to further clarify the astigmatic contribution of the retina in PS.

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The Characterization of the Bursal Cells of the Retrocalcaneal Bursa for Potential Augmentation in Achilles Tendon Surgery

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Background/Objectives: Achilles tendinitis is a common overuse injury seen by orthopedists, where repetitive trauma leads to inflammation and scar development over the Achilles tendon. This can present as posterior heel pain and stiffness with foot movement, as well as progressive bony enlargement at point of insertion, making daily activities such as walking and wearing shoes difficult¹. Treatment is initially conservative but many patients eventually undergo surgical intervention. Often times, the Retrocalcaneal bursa, the bursa between the Achilles tendon and calcaneus, is also inflamed but this bursa is often discarded during surgery to improve visualization. There have been many research efforts to understand the anatomy and pathology of the Achilles tendon, however there is little reported about the Retrocalcaneal bursa and its potential role in healing.

Methods: This study aims to characterize the bursa to identify specifically whether mesenchymal stem cells exist and if so, their ability to differentiate and proliferate. Mesenchymal stem cells (MSCs) are multi-potent stem cells and have immunomodulatory features, secreting cytokines and immune receptors to regulate the microenvironment in human tissue. MSCs' multilineage potential and secretion of anti-inflammatory molecules make them a potentially effective tool in treatment of chronic diseases². We hypothesize that Retrocalcaneal bursa cell analysis will show mesenchymal stem cells with the ability to proliferate. Patients undergoing surgery for insertional Achilles tendinopathy will be included in this study and the Retrocalcaneal bursa of 6 patients will then be analyzed. Cells from the bursa will be cultured and assessed for 1) CFUs, 2) viability using a live/dead assay at time 0 and 3 weeks of culture, 3) cellular growth using proliferation assay after 3 weeks in culture, 4) growth factor release, 5) FACS analysis and 6) electron microscopy at time 0 and 3 weeks in culture. If the presence of mesenchymal stem cells is confirmed in this bursa, there may be a role for augmentation of Achilles tendon repair with this local tissue.

Conclusions: The study will reach completion at the end of 2020.

Supported by: The UConn School of Medicine Summer Research Fellowship

References:

1. Hatch, D. (2019, December 15). *Achilles Tendonitis*. Retrieved from Orthobullets: <https://www.orthobullets.com/foot-and-ankle/7022/achilles-tendonitis>
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Research Awards

SCHOOL OF DENTAL MEDICINE

ASSOCIATE DEAN'S AWARD: Awarded in recognition of an outstanding presentation in basic, clinical or behavioral science. The award consists of a complimentary meeting registration and monetary award of \$500 to assist with travel for a student who will be presenting at the AADR General Session & Exhibition to be held in Boston, MA in March, 2021.

COLGATE-PALMOLIVE STUDENT RESEARCH AWARD: A dental student will receive a scholarship award of \$1,000 in recognition of exemplary knowledge, understanding and presentation of basic and clinical dental research at Student Research Day.

CONNECTICUT HOLISTIC HEALTH ASSOCIATION: Presented by Dr. Michael Basso, this annual award was established to recognize excellence in research in Integrative/Complementary and Alternative Medicine. A medical student and a dental student will each receive a monetary award of \$100. Special thanks to Dr. Michael Basso of the Connecticut Holistic Health Association.

DEAN'S AWARD: Awarded in recognition of an outstanding presentation demonstrating clinical application and technique relating to dentistry. This award consists of an expense-paid trip as the School of Dental Medicine's representative to the Hinman Student Research Symposium held in Memphis, Tennessee and the student's name engraved on a plaque.

DENTAL STUDENT RESEARCH SOCIETY: Presented by Dr. Arthur Hand, a monetary award of \$100, for excellence in a science presentation by an undergraduate student.

DENTSPLY-SIRONA STUDENT CLINICIAN AWARD: Awarded by Mr. Joel Monteiro of Dentsply Sirona, in recognition of an outstanding presentation. Includes round-trip coach fare to the 2021 AADR General Session & Exhibition/Dentsply-Sirona SCADA Program held in Boston, MA in March, 2021 as the School's representative; allowance for lodging, food and other expenses and a Dentsply-Sirona crystal.

GUSTAVE PERL MEMORIAL AWARD: A scholarship award of \$100, for outstanding original research, and the student's name engraved on a plaque.

OMICRON KAPPA UPSILON-PHI CHI CHAPTER AWARDS: Two monetary awards of \$150 each are given in recognition of outstanding research; the first award is given for basic science research and the second award given for clinical science research.

Research Awards

SCHOOL OF MEDICINE

DEAN'S AWARD: In recognition of two outstanding medical student researchers and their faculty mentors. Awards of \$250 each will be presented to the four awardees. The awards to faculty mentors will be used for travel to a scientific meeting.

DR. AND MRS. JEFFREY GROSS AWARD FOR EXCELLENCE IN RESEARCH ACHIEVEMENT: Dr. and Mrs. Jeffrey Gross established this award. Jeffrey Gross, M.D., is Professor and Chair of the Department of Anesthesiology at UCHC. Awards of \$250 each will be given to two medical student researchers who presented excellent studies. One award will go to an oral presentation and one award will go to a poster presentation.

LAWRENCE G. RAISZ AWARD FOR EXCELLENCE IN MUSCULOSKELETAL RESEARCH: In honor and memory of Lawrence G. Raisz, M.D., this award of \$250 will be given to a medical student researcher who presented outstanding work in the field of musculoskeletal research.

WILLIAM M. WADLEIGH MEMORIAL AWARD FOR CROSS-CULTURAL AND INTERNATIONAL HEALTH RESEARCH: The award is in honor of William M. Wadleigh, PhD, anthropologist and Associate Director of the Center for International Community Health Studies in the Department of Community Medicine and Health Care, committed to global health education, who passed away from AIDS. The \$250 award is given annually to the medical student whose research best exemplifies international and cross-cultural understanding of health issues.

JOHN SHANLEY MEMORIAL GLOBAL HEALTH AWARD: The award is to honor the memory of John D. Shanley, MD, MPH, former Chair of Infectious Disease at the University of Connecticut, and Professor of Preventive Medicine and Public Health and Associate Dean of International Health at the Renaissance School of Medicine at Stony Brook University. This award is sponsored by FNE International and will be given in recognition of a project that best exemplifies collaboration towards sustainable services with an international partner. The student will receive a monetary award of \$200.

DR. JEFFREY GROSS ANESTHESIOLOGY SUMMER FELLOWSHIP POSTER AWARD: Dr. Jeffrey Gross established this award. Jeffrey Gross, M.D., is Professor and Chair of the Department of Anesthesiology at UCHC. An award of \$250 will be given to the Anesthesiology Summer Fellow who presents the best poster.

CONNECTICUT ACADEMY OF FAMILY PRACTICE: One medical student will receive this \$200 monetary gift for excellence in Primary Care Research.

CONNECTICUT HOLISTIC HEALTH ASSOCIATION: Awarded by Dr. Michael Basso, this annual award was established to recognize excellence in research in Integrative/Complementary and Alternative Medicine. A medical student and a dental student will each receive an award of \$100. Special thanks go to Dr. Michael Basso of the Connecticut Holistic Health Association.

Acknowledgements

In acknowledgment of the efforts of our Medical and Dental student researchers, their faculty mentors, the members of the Medical and Dental Student Research Committees and all those involved in making this day possible.

Medical & Dental Student Research Day Team 2020:

Dr. Lynn Puddington, Co-Chair, Director of Medical Student Scholarship and Research
Dr. Aditya Tadinada, Co-Chair, Director of Dental Student Research
Christine McNally, Academic Curriculum Coordinator, School of Medicine Curricular Affairs, Stage 1 Curriculum Manager
Ursula Knapick, Administrative Officer, School of Medicine
Lisa Ramsdell, Administrative Program Coordinator, School of Dental Medicine
Laura Didden, Business Service Manager, School of Dental Medicine
Adam Clymer, Administrative Program Coordinator, School of Medicine, Curricular Affairs
Darice Schroeder, Administrative Assistant, School of Medicine, Curricular Affairs
Tammy Boudreau, Administrative Assistant, School of Medicine, Curricular Affairs

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Dr. Lisa Barry	Dr. Kourosh Parham
Dr. Hugh Blumenfeld	Dr. Jeffrey Pella
Dr. Leslie Caromile	Dr. John Peluso
Dr. Emil Coman	Dr. Adam Perrin
Dr. Kevin Dieckhaus	Dr. Greg Rhee
Dr. Kirsten Ek	Dr. David Steffens
Dr. Judith Fifield	Dr. Helen Swede
Dr. Jeffrey Gross	Dr. Kristyn Zajac
Dr. Sandra Garrett	Dr. Yanjiao Zhou
Dr. Rosa Guzzo	Dr. Al-Nagger Iman, Lead
Dr. Barbara Kream	for The UConn Health and
Dr. Bruce Mayer	JAX Postdoctoral Scholars

Dental School Reviewers/ Judges

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Dr. Aadarsh Gopalakrishna	Dr. Eliane Dutra
Dr. Takanori Sobue	Dr. Aditya Tadinada

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Lawrence G. Raisz Award for Excellence in Musculoskeletal Research
William M. Wadleigh Memorial Award for Cross Cultural and International Health Research
John Shanley Memorial Global Health Award, FNE International
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Ms. Diane S. Peterson, Colgate-Palmolive Student Research Award
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Medical and Dental Student Posters and Digital Presentations

Academic Rotunda Hallway

Poster #	Last Name	First Name
01	Antony	Maria
02	Arciero	Emily
03	Bekheet	George
04	Cucka	Bethany
05	Daigle	Ryan
06	Emlein	Rose
07	Foster-Spence	Chase
08	Kriscenski	Danielle
09	Landry	Arthur
10	McKenna	Mark
11	Slater	Maria
12	Tamburini	Lisa
13	Ahle	Gabriella
13	Srinivasan	Rati
14	Bentivegna	Kathryn
15	Bertenshaw	Jessica
16	Boch	Marisa
17	Gallaer	Alexander
18	Garrett	Miranda
19	Harrison	Lauren
20	Jenkins	Nathaniel
21	Miller	Caity
22	Moten	Ashleigh
23	Pflomm	John
24	Purtell	Hannah
25	Sindvani	Rhea
26	Stoj	Victoria
27	Tan	Xinyue
28	Cardarelli	Lauren
29	Chen	Albert
30	Cohen	Madison
31	Guido	Tyler
32	Gupta	Bhavin
33	Kim	Jay
34	McKenna	Alexandra
35	Moynahan	Mikayla
36	Regan	Courtney
37	Salustri	Rebecca
38	Violette	Robert
39	Wittstein	Matthew

Digital Presentations Room A7 & A8

Time	Last Name	First Name
1:30	Schultz	Gwendolyn
1:45	Hannon	Erin
2:00	Nkwocha	Erica
2:15	Oni	Tijesunimi
2:30	Hudon	Rebecca
2:45	Parikh	Purven

Academic Lobby

Poster #	Last Name	First Name
40	Adeyeye	Adeola
41	Bana	Divya
42	Beaudoin	Michele
43	Benedetto	Lauren
44	Black	Sarah
45	Carpenter	Sandra
46	Carty	Crista
47	Chen	Brett
48	Chimileski	Brock
49	Dean	Matthew
50	Defusco	Audrey
51	Fones	Lilah
52	Garrell	Jacob
53	Harrell	Jonathan
54	Holmes	Aaron
56	Lambert	William
57	Lubonja	Klair
58	Malik	Mohammed
59	Mills	Margaret
61	Pingle	Srinath-Reddi
63	Schwartz	Rebecca
64	Steele	Jacqueline
65	Whittall	Ian
66	Yon	Christian
67	Zeng	Francine
68	Bompastore	Andrew
69	Lee	Jiyae
70	Tan	Xinyue
71	Milone	Connor

**Academic
Rotunda**

**Medical Poster
Presentations**

#1 - # 12

- Laboratory

#13 - #27

- Public Health

**Dental Poster
Presentations**

#28 - #39

**Academic
Lobby**

Medical Poster Presentations #40 - #71

- Clinical
- Clinical - Anesthesiology