11th Annual Women in Medicine Research Day

Celebrating the Research Accomplishments of Women in Medicine

Wednesday, March 8, 2017

Stony Brook School of Medicine
Health Sciences Center
Welcome Address for the 11th Annual Women in Medicine Research Day

I would like to welcome all of you to the 11th annual Women in Medicine Research Day. The Women in Medicine Program at Stony Brook School of Medicine highlights the achievements of women in healthcare and medical research.

It is an honor to Coordinate and Chair this esteemed event and I am so proud that the number of abstract submissions increased from 60 in 2016 to 78 in 2017. This shows that there is a real need for a forum such as Women in Medicine to highlight the research achievements of our female faculty and students. We applaud everyone who submitted abstracts this year!

Our Abstract review committee consisted of Dr. Laura Hogan (Chair), Dr. Agnieszka Bialkowska, Dr. Silvia Spitzer, Kavitha Yaddanapudi, Dr. Dhana Balakrishnan, Dr. Rokhsareh Khatami and Dr. Stephanie Liu. They gave up their invaluable time to accomplish in a few days the daunting task of critically reviewing all 78 submissions. Their dedication and commitment is greatly appreciated.

As the Chair of the Organizational committee, I would also like to thank Qiwen Dong, Kim Chang, Chelsea Estrada, Victoria Ly, Rose Folliero and Jamie Trupiano for participating. I would like to express my sincere appreciation for their enthusiasm in creating such a beautiful and enjoyable day.

The abstract submissions and researchers were diverse as we received submissions from undergraduate students, graduate students, post-doctoral fellows, fellows, medical students, residents and faculty in medicine, pathology, biomedical engineering, public health, nursing and dentistry. Fellow Finalists: Joan Salnave, MD, MPH, and Melissa Macomber-Estill, MD; Post-Doctoral Fellow Finalists: Hui-Chen Chang Foreman, PhD, Cindy Leiton, PhD, and Julie M. Kim; Resident Finalists: Dianne Lee, DO, MBA, and Li Huang, MD; Undergraduate Finalists: Amna Haider and Winnie Yu; Faculty Finalists: Weiqin Lu, PhD, and Silvia Spitzer, PhD; Graduate Student Finalists: Pallavi Srivastava, MBBS, and Qiwen Dong; Medical Student Finalists: Anh Nguyen and Natalie Mackow, and the to-be-announced winners were considered to be exceptional in their respective categories.

The Abstract sessions will be very diversified. All Abstracts will be presented in a one minute “Reader’s Digest” version in two separate sessions. After the presentations we will all proceed to tables where the presenters will be available for discussion.

I would like to thank Dr. Latha Chandran for agreeing to deliver this year’s Key Note Address titled, “Snowballing Academic Excellence: The Power of Networking, Mentorship and Collaboration.” Dr. Chandran will also be making the closing remarks at the end of the event. Thank you, Dr. Chandran.
for your full support and input. Your novel and innovative suggestions have helped so much in making Women in Medicine Research Day a success.

I would also like to thank our esteemed panelists, Dr. Marie Badalamente, Dr. Margaret McGovern, Dr. Barbara Nemesure and Dr. Lee Anne Xippolitos. We appreciate all of you taking the time from your busy schedules to participate in the Women in Medicine Research Day and are looking forward to hearing about your career journeys.

I would also like to thank Jamie Trupiano and Rose Folliero for their tremendous efforts in working with me to execute every single detail for this event. It was truly like the making of a wedding or Bar Mitzvah. Their dedication was monumental and greatly appreciated.

Thank you to Jeff Swain, PhD, for your innovative ideas. You have played a key role in the creation of the Women in Medicine website, allowing us to expand our audience and keep them informed.

A special thank you to Mr. John Mastaccioula, Ms. Maureen Gelsomino and Ms. Colleen Hilbert for providing the coffee, pastries and the donation of Starbucks gift cards for our esteemed winners.

Thank you, Mr. John Riley, for your continued support of Women in Medicine; it is greatly appreciated.

Last, but not least, I want to thank Dean Kenneth Kaushansky for his longstanding commitment to the Women in Medicine at Stony Brook School of Medicine. I would be remiss if I did not extend my gratitude to our Dean for not only providing a venue to celebrate the research achievements of women, but also by appointing women in key leadership positions in the School of Medicine.

In closing, we hope that you enjoy the 11th Annual Women in Medicine Research Day event. I am very excited about today’s Program showcasing the remarkable research accomplishments of women undergraduate students, graduate students, post-doctoral fellows, fellows, medical students, residents and faculty in medicine. Let’s all sit back and enjoy!

Ann-Leslie Berger-Zaslav, PhD
Coordinator, Women in Medicine Research Day
Chair, WIM Organizational Committee
8:00-9:00 a.m.  PEDIATRIC GRAND ROUNDS  
Level 2, LH 4

KEYNOTE ADDRESS:  “Snowballing Academic Excellence:  
The Power of Networking, Mentorship and Collaboration”

Latha Chandran MD, MPH  
Vice Dean, Academic and Faculty Affairs  
Miriam and David Donoho Distinguished Teaching Professor  
SUNY Distinguished Teaching Professor  
Founding Director, Donoho Academy of Clinical and Educational Scholars

9:15 a.m.  WELCOME ADDRESS

Ann-Leslie Berger-Zaslav, PhD  
Coordinator, Women in Medicine Research Day  
Chair, WIM Organizational Committee  
Associate Professor of Pathology, Department of Pathology/Cytogenetics, Stony Brook School of Medicine

9:15-10:15 a.m.  1st Session – Abstract Presentations

10:15-10:45 a.m.  Discussion & Coffee Break

10:45-11:45 a.m.  PANEL DISCUSSION  
Moderator: Laura Hogan, MD

“Achieving a Successful Career for Women in Medicine”

Panelists:  Marie A. Badalamente, PhD  
Margaret McGovern, MD, PhD  
Barbara Nemesure, PhD  
Lee Anne Xippolitos, RN, PhD, CS, NPP, NEA-BC

11:45-12:00 p.m.  Lunch

12:00-1:00 p.m.  2nd Session – Abstract Presentations

1:00-1:15 p.m.  Discussion
1:15-1:30 p.m.  ABSTRACT AWARDS

Presented by: Ann-Leslie Berger-Zaslav, PhD

Fellow Abstract Finalists
Joan Salnave, MD, MPH
Melissa Macomber-Estill, MD

Post-Doctoral Fellow Abstract Finalists
Hui-Chen Chang Foreman, PhD
Cindy Leiton, PhD
Julie M. Kim

Resident Abstract Finalists
Dianne Lee, DO, MBA
Li Huang, MD

Undergraduate Abstract Finalists
Amna Haider
Winnie Yu

Faculty Abstract Finalists
Weiqin Lu, PhD
Silvia Spitzer, PhD

Graduate Student Abstract Finalists
Pallavi Srivastava, MBBS
Qiwen Dong

Medical Student Abstract Finalists
Anh Nguyen
Natalie Mackow

1:30 p.m.  CLOSING REMARKS

Latha Chandran MD, MPH
Vice Dean, Academic and Faculty Affairs
Miriam and David Donoho Distinguished Teaching Professor
SUNY Distinguished Teaching Professor
Founding Director, Donoho Academy of Clinical and Educational Scholars
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Biographies

Latha Chandran, MD, MPH, Keynote Speaker

*Latha Chandran MD, MPH* is the Vice Dean for Academic and Faculty Affairs, Founding Director of the Donoho Academy of Clinical and Educational Scholars (ACES), David and Miriam Donoho Distinguished Teaching Professor and SUNY Distinguished Teaching Professor in the Department of Pediatrics at Stony Brook University School of Medicine, in Stony Brook, New York. She received her medical degree from Kerala University, Medical College Trivandrum, India, and her MPH from Johns Hopkins University. After her residency and chief residency at Stony Brook University Hospital, Dr. Chandran joined the Division of General Pediatrics and soon became the Division Chief in 1995. In 2005, Chandran became the first clinician educator to receive tenure in the Educator Scholar track at Stony Brook University School of Medicine. Dr. Chandran has served as the Vice-Chair for Education in the department as well as the Interim Chair of the Department of Pediatrics.

Dr. Chandran has several years of academic leadership experience. During her tenure as Division Director of General Pediatrics (1995-2006), she led a successful expansion of primary care access ensuring financial solvency and appropriate trainee education. Within the division, she established an accredited Academic General Pediatric Fellowship Training Program with a Certification in Patient Care Quality Scholarship. She has experience serving on medical school admissions committee as well as academic promotions and tenure committee and was instrumental in creating institutional guidelines to facilitate promotion of clinician educators using an educator portfolio template.

Since 2003, Dr. Chandran has served in various capacities in the School of Medicine Office of the Dean. In her current role as the Vice Dean, she is responsible for all aspects of undergraduate medical education, including Curriculum, Admissions, Accreditation and Student Affairs. She is also responsible for faculty affairs and faculty development programs. Institutionally, she has successfully led several strategic planning committees, educational award committees, and curricular reform initiatives. In 2011, Dr. Chandran was the leader of the school’s Liaison Committee on Medical Education Accreditation Site Visit Preparation team and led the school through a transformative team building process that has been published in Academic Medicine. In 2013, she was named the Founding Director of the Academy of Clinical and Educational Scholars (ACES) at Stony Brook School of Medicine. In 2016, Dr Chandran was inducted into the SUNY Distinguished Academy after being promoted to Distinguished Teaching Professor. In 2017, she was endowed as the David and Miriam Donoho Distinguished Teaching Professor at Stony Brook School of Medicine.

Nationally, Dr. Chandran is the co-director of a large, three-year national faculty development and certification program -- the Academic Pediatric Association (APA)’s Educational Scholars Program, a program with a huge national impact over the past 11 years. She served as the elected Chair of the Education Committee of the APA 2015-2016. Dr. Chandran has extensive leadership training and experience and has served as a faculty advisor for the Executive Leadership in Academic Medicine (ELAM) Program. Dr. Chandran is a board member at the National Board of Medical
Examiners and has served on several journal editorial boards. She conducts site visits with the LCME teams to various medical schools across the country. Dr. Chandran is board certified in Pediatrics and Adolescent Medicine and is the recipient of many teaching awards including the President’s and Chancellor’s teaching awards as well as the Mentor of the Year award. Her areas of expertise include faculty development, curricular innovations, educator portfolios and educational scholarship.

Ann-Leslie Berger-Zaslav, PhD
Coordinator, WIM Research Day 2017
Chair, WIM Organizational Committee

Research Summary: Ann-Leslie Berger-Zaslav, PhD, is involved in translational research using cytogenetic and molecular cytogenetic techniques to elucidate cryptic unidentifiable structural chromosome abnormalities, euchromatic and heterochromatic variant chromosomes and determining gene amplification and/or alterations. The significance of these abnormalities is used to diagnose, prognose and treat patients. This research is performed on pediatric and adult patients with inherited and acquired (cancer) chromosome abnormalities.

Clinical Practice: Dr. Berger-Zaslav is Board certified in Clinical Cytogenetics and she also holds a New York State Certificate of Qualification for the area of Cytogenetics and Microarray technology. Dr. Berger-Zaslav is the Head of Cytogenetics at Stony Brook University Medical Center.

Under her direction, the Cytogenetics Laboratory performs chromosome analysis on patients undergoing prenatal diagnosis, patients with inherited genetic disorders, mental retardation, developmental delay, autism, and adults and children with cancer. This involves standard chromosome analysis, molecular cytogenetics (FISH) and subtelomere analysis (FISH) on: bone marrow, solid tumors, lymph nodes, peripheral bloods, amniotic fluid, and products of conception. The Cytogenetic laboratory is the ONLY laboratory in Suffolk County certified to perform cytogenetic analyses on pediatric patients with acute lymphoblastic leukemia (ALL) for the Children's Oncology Group (COG). Dr. Berger-Zaslav reviews and reports on all cases evaluated in the Cytogenetics laboratory. She personally notifies the referring physician with abnormal results and is available for consultation and questions.

Dr. Berger-Zaslav also holds Faculty positions in the School of Health Technology and Management and the School of Nursing. She is also an adjunct Professor at Long Island University C.W. Post. Dr. Berger-Zaslav developed and instituted the first Cytogenetics course for the Medical Technology School at Stony Brook University, and is actively involved in teaching Medical Students, Residents, Fellows, Physician's Assistants, Nurse Practitioners, and Attendings.
Panelists

Marie A. Badalamente, PhD

Marie Badalamente, PhD, is a Professor in the Department of Orthopedics at Stony Brook University Medical Center. Dr. Badalamente has been widely recognized within her field for her work examining collagenase injection as an FDA-approved treatment for Dupuytren’s contracture. This same drug is in clinical trials for Frozen Shoulder Syndrome and as a cosmetic procedure for the treatment of cellulite. Dr. Badalamente has traveled and lectured worldwide to Italy, France, Spain, England, Belgium and Australia. She has presented to the British Society for Surgery of the Hand, the Japanese Society for Surgery of the Hand, and the Spanish and Italian Societies for Surgery of the Hand. Dr. Badalamente was recently an awardee of the Clinical Orthopaedics and Related Research/Orthopaedic Research Society Richard A. Brand Award for Outstanding Orthopaedic Research for work in Frozen Shoulder.

Margaret McGovern, MD, PhD

Margaret M. McGovern, MD, PhD, joined Stony Brook University Medical Center in 2007 when she was appointed Chair of the Department of Pediatrics. A nationally recognized geneticist and medical educator, Dr. McGovern is leading the clinical, research, and educational mission of one of Stony Brook Medicine’s largest academic departments. When Stony Brook Children’s Hospital was established in 2010, Dr. McGovern was named the hospital’s first Physician-in-Chief and is spearheading its’ growth. Dr. McGovern has been recognized in Castle Connolly’s Top Doctors lists for her work in clinical genetics and was named the Knapp Chain in Pediatrics last year in recognition of her expertise, passion and insistence on high standards in the care of pediatric patients.

Barbara Nemesure, PhD

Barbara Nemesure is a Professor in the Department of Family, Population and Preventive Medicine and the Acting Head of the Division of Epidemiology and Biostatistics. She is also the Program Leader for Cancer Prevention and Control in the Stony Brook Cancer Center and the Director of Stony Brook’s Lung Cancer Program, which includes the Center for Lung Cancer Screening and Prevention (CLCSP) and the Lung Cancer Evaluation Center (LCEC). Dr. Nemesure further leads the Diversity Program in the School of Medicine and Chairs both the Faculty Diversity and Advisory Council, as well as the Faculty AA/EEO committee. In addition to her primary appointment in the School of Medicine, she holds appointments in
the Department of Ophthalmology, the School of Nursing, and the Department of Applied Mathematics and Statistics in the College of Engineering and Applied Sciences.

Dr. Nemesure earned her Bachelor's degrees in both Statistics and Psychology from Stony Brook University and then went on to obtain a PhD in Statistical Genetics at Stony Brook. She interned at the Mount Sinai School of Medicine for two years before accepting a position in the Department of Preventive Medicine at Stony Brook Medicine in 1993.

Dr. Nemesure is an accomplished research scientist. During the first decade of her career she investigated genetic determinants of eye diseases in Barbados, West Indies and later transitioned over to the study of hereditary breast and prostate cancer in Barbados. More recently, Dr. Nemesure has focused on building the lung cancer research program within the Cancer Center at Stony Brook. As a Principal Investigator on numerous large-scale grants, she has successfully been awarded over $8 million in funding from the National Institutes of Health. This financial support was primarily provided by the National Cancer Institute for her research involving the study of epidemiologic and genetic determinants of cancer. Dr. Nemesure has more than 110 publications in prestigious peer-reviewed scientific journals and is actively involved in mentoring students, residents, fellows and junior faculty who are interested in pursuing careers in cancer research.

Lee Anne Xippolitos, RN, PhD, CS, NPP, NEA-BC

Lee Anne Xippolitos, RN, PhD, CS, NPP, NEA-BC, is Dean of the Stony Brook University School of Nursing. Working closely with the faculty and department chairs, she leads the establishment and implementation of academic, research and clinical practice programs. She is also responsible for implementing New York State Department of Education, University and School policies, overseeing all support services for the School, and addressing needs of students, faculty and staff.

She received her BS degree and MS degree from Stony Brook University School of Nursing. She is licensed as a Clinical Nurse Specialist as well as a Nurse Practitioner in psychiatric nursing. She completed her PhD at Adelphi University in Garden City, New York. She holds a certificate as a certified Nurse Administrator with the American Nurses Credentialing Center.
Abstracts:
Accepted Presentations

11th Annual Women in Medicine Research Day

Wednesday, March 8, 2017
THE CHARACTERISTICS AND PROGRESSION OF BACTERIAL BIOFILMS ON URINARY CATHETERS

Authors: Anh Nguyen*, Glenn Werneburg, Jason Kim, Annie Rohan, David Thanassi, Stony Brook, NY

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Submission Category: Medical Student

Introduction: The majority of hospital-acquired urinary tract infections (UTIs) are catheter-associated UTIs (CAUTIs), which are associated with increased morbidity and mortality in patients, with 13,000 attributed deaths annually. CAUTIs are also associated with increased length of hospital stays and 0.4-0.5 billion USD in annual healthcare costs, as well as unnecessary antimicrobial use. The formation of biofilms (groups of bacterial cells that adhere to one another and to a fixed surface) on catheters is critical to the development and persistence of CAUTI, as biofilms function as both barriers to antibiotics and reservoirs of microbes. We sought to determine the natural history of biofilm formation on urinary catheters. In particular, we were interested in the starting location(s) of biofilm formation, and whether biofilms predominated proximally or distally on catheters, their timing and manner of progression, and whether catheter biofilm formation was predominantly extraluminal or intraluminal.

Methods: Foley catheters (n=19) were collected from outpatient and inpatient clinics at a large university medical center from post-surgical patients at 1 to 28 days indwelling time. Each catheter was sectioned and stained, and biofilms were quantitated using spectrophotometry.

Results: Short-term catheters (indwelling <1 week) displayed predominant biofilm formation at the proximal (bladder-exposed) end, whereas long-term catheters (indwelling 3-4 weeks) displayed significant biofilm formation throughout all segments. Biofilm growth on short-term catheters was predominantly extra-luminal, whereas long-term catheters demonstrated significant extra- and intra-luminal biofilm staining.

Conclusions: The results of this preliminary study inform approaches to developing novel strategies to prevent and eradicate bacterial biofilms from urinary catheters. For example, this study suggests that catheter-coating techniques targeting the extraluminal surface of the proximal end of the urinary catheter may contribute to a delay of biofilm formation, and reduce the overall risk of CAUTI. Efforts are under way to further investigate biofilm progression with larger sample sizes, and to determine how a reduction in biofilm formation and progression may contribute to reduced CAUTI risk.
IMPACT OF RESEARCH ARTICLES IN MAJOR RADIOLOGY JOURNALS BY AMERICAN FEMALE AUTHORS: A 30-YEAR ANALYSIS

Authors: Derek Kim, Mingqian Huang, Ana Franceschi, Mark Schweitzer

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Submission Category: Medical Student

Introduction: The number of women in radiology has increased in the past several decades with corresponding increase in female authors in leading radiology journals. However, female radiologists still lag their counterparts in academic rank. Here, we investigate the impact of original research articles published by female first and last authors in Radiology and AJR by comparing their citations received with male authors.

Methods: This is a retrospective bibliometric analysis. Data were collected from Web of Science on original articles published in Radiology and AJR for the years of 1984, 1994, 2004, and 2014, restricted to authors in the United States. The genders of first and last authors of the articles were categorized by evaluating first names. Unfamiliar names were evaluated by three gender-determining websites, and consensus of two resulted in categorization. Unsuccessful categorization or having a unisex name prompted an internet investigation. Collected data included the number of coauthors, references, citations, and pages. Analysis was conducted using two-sample t-test assuming unequal variance.

Results: A total of 2387 articles met criteria, and the genders of 4723 of 4774 (98.9%) authors were successfully categorized. There were 482 of 2354 (20.5%) categorized female first authors and 340 of 2369 (14.4%) female last authors. There was a significant difference in mean citation count between male and female first authors (42.0 vs 33.9, p<0.0001) but only a trend for a difference by last author (42.0 vs 36.8, p=0.07). Subgroup analysis by year revealed significant differences in 1984 between male and female first authors (41.5 vs 31.1, p=0.002), with a trend towards significance in 1994 (64.3 vs 53.1, p=0.07), that disappeared in 2004 (46.2 vs 45.3, p=0.87), and 2014 (8.8 vs 7.8, p=0.24). There was significant difference in the mean number of pages per article by male and female first authors (5.5 vs 5.9, p=0.003) and last authors (5.5 vs 6.0, p=0.002), but subgroup analysis by year no significant difference (p-value from 0.09 – 0.98). There were no significant differences in number of coauthors for first or last authors (p=0.08 and 0.81) or in number of references for first or last authors (p=0.24 and 0.71).

Conclusion: Original research articles published by female first authors every year had on average fewer citations than their male counterparts. Articles published by female first authors in 1984 were cited significantly less often than by male first authors, with this discrepancy gradually fading over time.
Introduction: Anterior cruciate ligament (ACL) reconstruction is one of the most common knee surgeries. The purpose of our study is to utilize UTE to learn about collagen remodeling and ligamentization of ACL grafts.

Methods: 8 patients (22-49 years, median 33 years, standard deviation 10.3 years) were recruited in this prospective IRB-approved study. All patients underwent ACL reconstruction via a Graftlink® semitendinosus autograft. All 8 patients had knee MRI (3T Siemens Biograph mMR) 3 and 6 months post-procedure. 3 of the 8 patients had additional knee MRI at 12 months post-procedure. 3D double-echo ultrashort echo time sequences (3D-UTE) were included in the MRI exam with echo times of 100, 270, 500, 4000, 5000, and 6000 microseconds. Regions of interest were placed along the ACL graft (femoral tunnel, intra-articular, and tibial tunnel). T2* signal was calculated using a monoexponential fit to the 3 shortest echo times with the 3 longer echo times used for baseline correction at all locations. A musculoskeletal fellowship trained radiologist reviewed all images to assess for morphological changes.

Results: Of the 8 patients who had 3 and 6 month knee MRIs, 5 patients (63%) demonstrated a decrease in T2* signal along the graft as a whole, ranging -7.0 to -13.2%. 3 patients (37%) demonstrated an increase in T2* signal ranging 1.2-6.3%. When the graft was evaluated in the above mentioned three regions, T2* signal decreased within the femoral tunnel in 6 of 8 patients (75%) ranging -0.6 to -13.3%, decreased intra-articularly in 5 of 8 patients (63%) ranging -4.6 to -15.6%, and decreased within the tibial tunnel in 5 of 8 patients (63%) ranging -6.7 to -12.4%.

Of the 3 patients who had 12 month postoperative knee MRI, T2* signal changes were consistent across all three scans. 2 patients, who had an increase in signal at both 3 and 6 months, continued to demonstrate an increase in signal ranging 5.0 to 12.0%. 1 patient, who had a decrease in signal at both 3 and 6 months, continued to demonstrate a decrease in signal of -12.0%.

Conclusions/Clinical Relevance: As ACL grafts mature and undergo ligamentization, fast T2* signal shortening may be detected using 3D-UTE. A larger scale study is warranted to further our understanding of signal changes of graft maturation. This may be promising in evaluating patients with continued pain, which could be attributed to failure of ligamentization of their ACL grafts.

CORIHS approval date & number: IRB 05/31/2016 572684-12

Financial disclosures: Elaine S. Gould – Consultant, Endo Pharmaceuticals Inc.
Mingqian Huang – Consultant, Endo Pharmaceuticals Inc.
ANALYSIS OF CONGESTIVE HEART FAILURE PATIENTS WITH PERCUTANEOUS CORONARY INTERVENTION, CORONARY ARTERY BYPASS GRAFT, PERMANENT PACEMAKER, OR AUTOMATIC IMPLANTABLE CARDIOVERTER DEFIBRILLATOR AND THEIR UNDERSTANDING OF HEART FAILURE DIAGNOSIS

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Submission Category: Fellow

Introduction: Heart failure is a debilitating condition that hospitalizes millions of people every year. Although there are many possible causes for heart failure, ischemic causes of heart failure are among the most common and those patient’s will usually require percutaneous coronary intervention with stent or will require coronary bypass graft. Furthermore, all patients with severe enough heart failure may qualify for pacemaker or automatic implantable cardioverter defibrillator due to concerns for abnormal heart rhythms. Patients with these devices or interventions must be followed closely in order to keep a close eye on cardiac function, status of heart failure, and devices themselves.

The purpose of this study is to understand how people with devices, percutaneous coronary intervention, or CABG understand their heart failure disease and how much insight they have into their condition.

Methods: A 15 question, paper based, survey was created to address key elements of heart failure that would measure the level of education of each patient on his or her diagnosis. The survey included yes or no questions, as well as multiple-choice. The surveys were distributed in the cardiac units at Stony Brook University Hospital as well as affiliated outpatient cardiology and primary care clinics. Data was analyzed to look at devices, valves, or PCI that patients had undergone and their understanding of their heart failure diagnosis and their awareness of their heart failure condition. It was also used to compare knowledge and understanding of heart failure in patients with devices versus those who did not.

Results: 77 patients were analyzed in this survey. Of the 18 patients included in the survey that had a device installed, 94.4% were aware of their heart failure diagnosis. Patients who had prior valve replacement, PCI or CABG were more likely to be aware of their diagnosis of heart failure as well. These patients also had a heart failure specialist, were aware of their medications, were checking daily weights, and knew the signs and symptoms of heart failure.

There is a trend towards more education and understanding of CHF and EF with in patients with devices suggesting that these patients receive more education about their disease, have closer follow up and over all physician contact. This contributes to better control of their heart failure and fewer admissions. This study shows that increased knowledge is an important factor heart failure maintenance, increasing patient compliance and possibly decreasing readmissions.
A PRELIMINARY NEEDS ASSESSMENT FOR SMOKING CESSATION SERVICES AMONG PATIENTS BEING SCREENED FOR LUNG CANCER

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Category: Faculty

Introduction: Lung cancer is the leading cause of mortality among all cancer types. Tobacco use is a primary risk factor for the development of disease, however resources for smoking cessation services are relatively limited. The purpose of this investigation is to evaluate the need for quit assistance services among patients being screened for lung cancer.

Methods: A subset of 120 current smokers identified by the Center for Lung Cancer Screening and Prevention (CLCSP) at Stony Brook were given a “Readiness to Quit” Ladder (RTQL) before and after their lung cancer screening visit, which includes a low-dose CT scan and complete history and physical. The RTQL is an ordinal scale tool which provides an assessment of a patient’s motivation to quit with scores ranging from 1 (I have no interest in quitting) to 10 (I have quit). A score of 6 or higher is used to indicate a “real” readiness to engage in/maintain a smoking cessation effort. The program’s nurse practitioner (NP), who has extensive experience with smoking cessation counseling, engages all patients in a dialogue about tobacco use and quitting/abstaining during the clinic visit. The Wilcoxin Signed Rank Test was used to compare pre- and post- visit RTQL scores, thereby providing an indication of the influence of the discussion on quit readiness.

Results: The CLCSP currently includes 683 patients and approximately 40% of patients being screened for lung cancer are current smokers. Among a subset of 120 patients receiving the RTQL prior to and following their screening examination, 50.0% reported a score of >=6 before their visit and 85.8% reported a score >=6 after engaging in a dialogue with the NP counselor. A total of 21.7%, 16.7% and 7.5% of patients increased their readiness scores by 1, 2 and 3 points, respectively, by the end of the visit. The influence of the clinical conversation was statistically significant (Wilcoxin Signed Rank Z=-5.92, p<0.001).

Conclusions: A significant number of lung cancer screening patients are current smokers yet are motivated to quit. This change in behavior, however, often requires a personalized plan for success. At present, tobacco cessation resources are mainly limited to a 6-week county group program and/or the State quit line. This pilot investigation provides preliminary support for the positive impact of a healthcare professional in the smoking cessation effort and suggests that consideration of establishing a more formal and comprehensive smoking cessation program is warranted.

Subjects (CORIHS) approval: #618850
LEVERAGING THE USE OF FITNESS TRACKERS WITH PARENT/adolescent PARTNERSHIPS TO INCREASE PHYSICAL ACTIVITY

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Submission Category: Faculty

Introduction: Childhood obesity has a significant life-long impact on the individual and the healthcare system. Addressing adolescent obesity requires novel, innovative approaches. Our study aimed to increase physical activity for overweight/obese adolescents and their parents over a 10 week pilot study utilizing smartphone-enabled activity tracker data to tailor motivational interviewing and goal setting.

Methods: Eligible adolescents, ages 13-16 with BMI >85\textsuperscript{th} percentile, and their parents were consented and provided medical clearance prior to participation. Parent-teen dyads were queried as to behaviors, barriers to change, perceptions about exercise and health pre- and post-intervention. We captured daily step count, active minutes, and sleep data via fitness trackers. Trained staff made follow-up scripted phone calls to dyads at weeks 1, 2, 4, and 8 to set daily personalized step count and active minutes goals based upon prior data and age-specific CDC goals. A post-intervention interview was completed at week 10. All data were entered into Study Trax\textsuperscript{TM}. Longitudinal data analyses were completed using linear mixed-effect models in SAS®.

Results: 9 adolescent (4 female/5 male) and parent dyads (all female) participated. Adolescent mean age was 15 (range 14-16); parents mean age was 47 (range 36-66). On average, 35\% (range 13-58\%) of the days they wore the tracker, adolescents met their personalized daily step count goal set and/or the minimum goal set by the CDC. 42\% (range 3-71\%) of the days they wore the tracker, the parents met their step count goals; Adolescents met their active minutes goals and/or the minimum goal set by the CDC 53\% (range 33-85\%) of the time. Parents did so 82\% (range 48-97\%) of the time. Fluctuations could be attributed to nontrackable activities (e.g. swimming), illness, inactivity (work/school) and periodic tracker-syncing failures. Parental age was inversely correlated with step count success (p=0.03). Parent and adolescent step count success rates were strongly correlated (p=0.0064).

Conclusions: Our findings that parent-teen dyads have highly correlated step count success rates suggest that further investment in family-centered weight management strategies merit consideration by policy makers, insurers, and health care providers.

Funding sources: Targeted Research Opportunities Grant through Stony Brook University School of Medicine

CORIHS approval date & number: CORIHS 474414, continuing Review last approved 3/2016
IMPROVING CHRONIC NON-CANCER PAIN MANAGEMENT IN AN INTERNAL MEDICINE RESIDENCY CONTINUITY CLINIC

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Submission Category: Resident

Introduction: Chronic non-cancer pain (CNCP) is among the most prevalent issues in primary care offices. Given the lack of clinical consensus and research-supported guidance, it is challenging for physicians to know when and how to prescribe opioid analgesics for chronic pain without increasing public health risks. We aimed to assess the overall adherence with narcotic guidelines and assessed the effectiveness of a standardized intervention in our continuity clinic. Our objective was to improve delivery of care for CNCP and increase clinician adherence to guidelines through workflow re-design and use of a standardized EMR template.

Methods: Prior to intervention, we conducted a retrospective cohort study of patients on chronic narcotics seen over a 3-month period in 2014. Only 57% of patients had documented narcotic agreements and 27% had an annual toxicology screen. To improve adherence to narcotic prescription guidelines, we standardized documentation of CNCP management, risk stratified patients on opiate therapy, and re-designed the workflow for opioid renewal. An EMR pain management template was distributed, documenting annual toxicology and narcotic agreements. We assessed process measures and clinical outcomes 6 months post-intervention.

Results: 119 charts were reviewed with 46 charts excluded due to malignancy, opiate use less than 3 months or transfer of care from our practice. Utilization of the EMR pain management template was 41/73 (56%). Annual toxicology was documented in 57/73 (78%) and narcotics agreements were documented in 58/73 (79%) charts. Over 6 months, opiate doses were decreased in 23%, increased in 20.5%, and unchanged in 56% of patients. Template use was correlated with increased adherence to annual toxicology OR 23.2, (CI 3.8-140, p<0.0001) and narcotic agreement OR 76, (CI 4->999, p=0.0001). Template use was not associated with a change in opiate regimen (p=0.62) or use of non-pharmacologic adjunct therapy (p=0.28). Template use improved stratification of patients to high or low risk categories and utilization of office visits for renewal of medications with OR 2.8 (CI 1-7.8, p=0.04).

Conclusions: Implementation of a standardized EMR template and restructured work-flow was effective in increasing adherence to process measures, specifically documented narcotics agreements and annual toxicology. Templates use also correlated with improved patient risk-stratification and visit utilization. Our intervention streamlined prescription of opiates for CNCP, encouraging best practice guidelines. Next steps include interventions which further promote template utilization among providers.
HOW ATYPICAL CAN ATYPICAL HUS BE?

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ABSTRACT: A 17 year old obese African American female presented with dyspnea, intermittent fever, myalgias, rash, vomiting, and diarrhea for 1 month. She was tachycardic, hypertensive, anuric, and found to have lower extremity pitting edema and decreased breath sounds at right lung base. Labs: WBC 15.5k/μL (10% eos), Hgb 5gm/dL, platelets 14k/ul, retic 7.1%, 3+ schistiocytes, LDH 3330 IU/L, low haptoglobin, elevated CRP and serum creatinine (SCr=3mg/dL), low albumin, elevated transaminases and triglycerides. Her ferritin was 5269 ng/mL. Rheumatologic markers were negative and C3/C4 were normal. PTT/INR were mildly elevated with normal fibrinogen level. Her urine had large blood and protein, 4 RBC, 17 WBC/hpf. Renal ultrasound showed enlarged kidneys with increased echogenicity. She had enlarged cardiac silhouette with small bilateral pleural effusions on CXR and her echocardiogram showed a large pericardial effusion. Urine and blood cultures were negative and stool PCR/cultures were negative for E Coli 0157.

Differential diagnosis included: Hemolytic Uremic Syndrome (HUS), Hemophagocytic Lymphohistiocytosis (HLH), Thrombotic Thrombocytopenia (TTP), and microangiopathic hemolytic anemia. She received platelet and RBC transfusions, plasmapheresis, hemodialysis, and pericardiocentesis. With ADAMS13 activity at 56%, TTP was ruled out, as was HLH with absence of other diagnostic criteria. A diagnosis of atypical HUS (aHUS) was presumed. Her renal biopsy showed thrombotic microangiopathy with interstitial nephritis. She received weekly Eculizumab infusions and showed clinical and renal function improvement after the 3rd infusion. Hemodialysis was discontinued, and SCr went down to 1.17 (most recent 0.88) mg/dl. She was sent home on oral steroids (for interstitial nephritis/serositis) and bi-weekly Eculizumab. Her pericardial and pleural effusions resolved and her steroids were discontinued.

We report an atypical HUS associated with interstitial nephritis, serositis and unusually high serum ferritin. Atypical HUS is now a term reserved for HUS without a coexisting disease, but with a dysregulation of complement cascade due to genetic background. Only 30% of patient with aHUS have low C3 levels. Decreased complement factor H or I are observed in 30-50% of patients with mutated CFH or CF1. Our patient’s genetic testing was positive for large CRHR1-CFHR3 homozygous deletion (Factor H autoantibody test was negative), two silent variants of unknown significance in exon 2 of CF1 and in exon 29 of C3, and heterozygous missense variant in exon 2 of DGKE. Ezulizumab should be instituted early to avoid progression to ESRD. In subjects with aHUS with genetic mutations this might be a lifesaving and lifelong treatment.
SERIAL PASSAGING PROVIDE INSIGHT INTO HOST-PATHOGEN INTERACTIONS AND THE DIRECT EFFECT ON REPLICATIVE LIFE SPAN AND FITNESS

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Submission Category: Graduate Student

Introduction: Cryptococcus neoformans (Cn) is a yeast pathogen responsible for causing over 1 million infections and over 600,000 deaths annually. In the host, Cn goes through a finite number of non-sexual, asymmetric replications (called the replicative life span (RLS)), which cause phenotypic differences between mother and daughter cells (including differences in vulnerabilities to antifungals and host defenses). RLS is a highly regulated trait that can be altered if a cell encounters various stressors like those seen in the host environment.

Previous studies have shown there is a negative correlation between life span and fitness in vitro. It has also been shown that life span can change under different stressful conditions such as those seen in vivo. This study investigated how the host environment alters Cn with respect to RLS and fitness.

Methods: Four Cn strains (H99, JEC21, J22, and I65) were passaged through macrophages for 100 passages. Galleria mellonella worms were colonized with H99 or JEC21 for 5 days before extracting the passaged isolates. Phenotypes (size, RLS, and replication times) of passaged strains were compared to those of parent strains.

Results: Macrophage passage: We found median RLS increased significantly in all four strains (1.2 - 2.3-fold increase, p<0.05, Log-Rank test). Replication time of all passaged strains increased significantly (1.9 - 3.1-fold increase, p<0.01, t-test). Cell body size decreased (13% - 26% decrease, p<0.01, t-test).

Galleria passage: Post passage median RLS dramatically increased by 2.4-fold (p<0.05, Log-Rank test) and doubling time increased 1.7-fold (p<0.01, t-test). Cell body size decreased 1.6 – 1.7-fold (p<0.01, t-test).

Conclusions: Our data suggests that there is a correlation between RLS and fitness (cell size and doubling time) in Cn. This is in agreement with the hypothesis that longevity comes at the expense of fitness. We further conclude that the host environment imposes significant stress on a fungal population leading to major shifts in these essential traits and the dynamic between them. Given that generational age is associated with vulnerability to host factors and antifungals, we intend to investigate how altered life span (through host passage) affects susceptibility to host defenses and antifungal drugs.

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PATHOGEN-ELICITED MUCOSAL γδ T CELLS: A MEMORY POPULATION WITH UNEXPECTEDLY BROAD REACTIVITY


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Title Category: Postdoctoral Fellows/Fellows/Residents

Introduction: γδ T cells are unconventional lymphocytes critically involved in tissue surveillance and pathogen control at mucosal surfaces. These lymphocytes are generally considered innate-like T cells that rapidly respond to infectious organisms through sensing machinery such as pattern recognition or cytokine receptors. However, we previously demonstrated that oral infection with a mouse-adapted strain of *Listeria monocytogenes* (*Lm*) induces protective multifunctional memory γδ T cells that express the Vγ4 T cell receptor and a distinct CD44hi CD27neg phenotype. These memory γδ T cells resided in the intestine and associated lymphoid tissues including mesenteric lymph nodes (MLNs) and appeared to be specific to *Lm*. This surprising adaptive-like response of memory γδ T cells prompted us to more closely examine the specificity and the induction of these cells.

Methods: 9-12 weeks old female Balb/c mice were orally infected by bread feeding with natural or mouse-adapted enteric bacteria. MLN cells were analyzed by flow cytometry during the effector phase (4-9 days post-infection (dpi)) or at memory (>30 dpi). Ex vivo stimulations were performed with live, heat-killed (HK) bacteria and culture supernatant to examine the activation requirements of memory γδ T cells.

Results: Oral infection with diverse enteric bacteria elicited the expansion of Vγ4 CD44hi CD27neg γδ T cells in MLNs. Interestingly, *Lm*-elicited memory γδ T cells also expanded after certain heterologous bacterial challenges. Moreover, their broad reactivity does not solely rely on sensing of infection-induced microbiota dysbiosis as memory γδ T cells were also induced after *Lm* infection of germ-free mice. Ex vivo stimulation of MLN cells with live, but not HK, *Lm* induced an early, innate-like (6 hours) IL-17A production by memory γδ T cells. However, IFNγ production was only detected after 24 hours with both live and HK bacteria, suggesting that adaptive-like activation may depend on antigen processing and presentation. Consistent with this observation, culture supernatant only induced IL-17A production by memory cells suggesting that IFNγ production requires cellular contact. Surprisingly, IFNγ production by *Lm*-elicited memory γδ T cells was also induced by several heterologous HK bacteria suggesting broadly conserved recognition of bacterial- or host-derived infection-induced ligands.

Conclusions: Collectively, these data suggest that Vγ4+ CD44hi CD27neg γδ T cells are a heterogenous subset of effector T cells comprised of both innate-like (IL-17A+) and memory adaptive-like (IFNγ+) cells with broad spectrum reactivity. These findings and the location of these cells within the gut implores further evaluation of their impact in infectious diseases and inflammatory disorders of the gut.

Funding: Stony Brook University Start-Up Funding
KERATIN 17 IDENTIFIES PROGNOSTIC SUBTYPES OF PANCREATIC DUCTAL ADENOCARCINOMA

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Introduction: Recent RNA sequencing (RNASeq) studies from Bailey et al., 2016, Moffitt et al., 2015 and Collisson et al., 2011 reported that mRNA expression from bulk tumor defines molecular subtypes of pancreatic ductal adenocarcinoma (PDAC) that are highly correlated with patient survival. These studies independently identified Keratin 17 (K17) mRNA overexpression as one of over 20 upregulated transcripts that define the RNA signature of the most lethal PDACs.

Methods: Retrospective survival analyses were performed in four independent cohorts of PDAC cases (total n= 558), by accessing the primary RNASeq data for K17 mRNA expression derived from the Bailey et al., 2016, Biankin et al., 2012, and the TCGA PDAC provisional study and by evaluating K17 expression by protein quantification on immunohistochemistry (IHC) stained sections from SBU achieve specimens. Cases were stratified using a uniform threshold definition of low- vs. high- K17 patients based on the Akaike information criterion within each cohort. Multivariate analyses were performed by Cox proportional hazards model to examine overall survival rates while adjusting for potential confounders such as stage and grade of the cancer. REMARK recommendations for tumor marker prognostic studies were followed.

Results: Studies in our lab determined that neither K17 gene missense mutations nor copy-number alterations explain the upregulation of K17 mRNA expression by malignant cells. In addition, we found that K17 expression, measured at the protein level by IHC or at the level of mRNA by RNASeq, is sufficient to stratify patients by short- vs long- term survival at baseline after resection. These retrospective survival analyses were performed in four independent patient cohorts using a uniform threshold to define low- vs high- K17 patients (total n= 558). High-K17 cases were twice as likely to die from this disease compared to stage-matched low-K17 cases (P values < 0.05). Furthermore, we determined that K17 expression is associated with outcome after Gemcitabine treatment using the Bailey et al., 2016 patient cohort (n= 94).

Conclusion/clinical relevance: This is the first study to show that the expression of a single gene, K17, can accurately subtype PDAC at initial diagnosis. In conclusion, K17 was identified as a robust and independent, clinically relevant, prognostic and predictive biomarker to stratify clinical outcome at the time of initial diagnosis and to potentially inform clinical decisions regarding chemotherapeutic intervention.

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Introduction: Globally, at least 300 million adults are classified as clinically obese1. Clinically obese patients, who have a BMI greater than 40, or 35 with comorbidity, become candidates for bariatric surgery. Obese individuals are at an increased risk of injury from falls as they may lack proper muscle mass to support their excess body weight to walk in a normal gait pattern.3 Therefore, this study aims to determine if there is any significant difference in the postural stability between control subjects and obese experimental subjects who were qualified for bariatric surgery.

Methods: In collaboration with Stony Brook University Hospital's Bariatric Surgery Department, this IRB-approved study compared the postural stability of 17 obese to 13 control subjects. Center of pressure (COP) measurements were taken with the subject standing still on a force plate. Swaying movements occurring in all radial directions including the anterior-posterior (AP) and medial-lateral (ML) directions were recorded based on the shift of COP (in mm). COP measurements were taken using a variant of the Romberg test, with both the patients’ eyes open and closed. The data obtained were then inputted to a custom MATLAB program, which calculated the peak displacements and velocities of their involuntary sway.

Data: Both mean AP and ML COP sway are significantly greater in magnitude for obese individuals than control (81%, 91%, respectively; p<0.05). The root mean square (rms) velocity for AP sway is 39.77% greater in magnitude for obese individuals (p<0.05); however, the rms velocity for ML sway is not significantly different between obese and control subjects (p>0.05). This data indicates that obese subjects involuntarily sway more and faster, particularly in AP direction, showing that they are less stable compared to the control subjects (p<0.05).

Conclusions: Obese subjects demonstrated significantly greater displacement of COP in AP and ML directions, as well as higher rms AP velocity as compared to control subjects, suggesting that clinically obese individuals have poorer postural stability than control patients and consequently a higher risk of falling. By understanding the specific characteristics that influence stability in obese conditions, treatment and therapy for obese subjects can be developed to minimize instability and reduce the risk for injury.

DIFFERENCES BETWEEN FEMALE AND
MALE CLAUDICANTS AFTER LOWER
EXTREMITY ENDOVASCULAR INTERVENTION

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Submission Category: Medical Student

Introduction: Historically, females have demonstrated lower primary patency rates and poorer outcomes after undergoing endovascular interventions. The purpose of this study was to utilize a contemporary vascular database (the national Vascular Quality Initiative or VQI) to assess the difference in primary patency between male and female claudicants with superficial femoral artery and popliteal artery disease after peripheral vascular intervention (PVI).

Methods: A retrospective analysis of all lower extremity endovascular procedures in patients presenting with claudication and with superficial femoral artery and popliteal artery disease from January 2010 to October 2015 in the national VQI database was performed.

Results: A total of 5,397 patients with claudication (3,424 males and 1,973 females) underwent an endovascular intervention for superficial femoral artery and popliteal artery disease in this cohort. There were statistically significant differences in the presentation of risk factors between males and females. Males were more likely to smoke (p < 0.0001), present with a history of coronary artery disease (CAD) (p < 0.0001) or congestive heart failure (CHF) (p = 0.0358), and have prior coronary artery bypass grafting (CABG) and percutaneous coronary intervention (PCI) (p < 0.0001). After matching for age and risk factors, primary patency at 1 year was significantly lower for males ages 50-59 compared to females within the same age group [Overall: 43%, N = 707 vs. 49.84%, N = 315, respectively (p = 0.0483); Diabetes Mellitus (DM): 39.73%, N = 292 vs. 49.44%, N = 180 (p = 0.0447); Hypertension (HTN): 41.68%, N = 583 vs. 51.12%, N = 268 (p = 0.0116); CABG/PCI: 41.57%, N = 267 vs. 56.19%, N = 105 (p = 0.015); Smoking & DM: 38.75%, N = 271 vs. 48.75%, N = 160 (p = 0.0444); Smoking & HTN: 41.41%, N = 553 vs. 50%, N = 238 (p = 0.0288)]. Overall primary patency at 1 year was not significantly different between males and females ≥ 60 years of age.

Conclusions: Within this national VQI database, males have significantly lower primary patency rates than females among patients ages 50-59, while older patients do not have significant differences in long-term outcomes. These findings are contrary to prior studies that show that females have lower primary patency and may suggest improvements in endovascular treatments for females.

CORIHS #: 2015-2952-R1
PSYCHIATRIC COMORBIDITY IN PATIENTS WITH PRADER WILLI SYNDROME – A CASE SERIES

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Submission Category: Medical Student

Introduction: How early can mood disorders present in patients with Prader Willi Syndrome? What is the most effective treatment modality for PWS patients who experience episodes of mania, aggression and preoccupations? Here we present five cases of pediatric and young adult Prader Willi Syndrome patients exhibiting episodic manic symptoms indicative of bipolar mood disorder. We subsequently discuss individual treatment regimens.

Literature Review: Prader Willi Syndrome (PWS) is a genetic disorder of physical and developmental consequence caused by loss of function on chromosome 15 (q11-q13). Frequently, patients with PWS will have concurrent behavioral disturbances such as preoccupation with food, skin picking or aggression[5]. Psychosis has also been described in the adult PWS population [1-3]. “Obsessive-compulsive tendencies,” aggression and autism spectrum disorder are seen in younger PWS populations [4,5,8,9]. Yet, little has been reported on the PWS population with bipolar disorder. In general, it takes almost ten years from onset of symptoms to diagnosis of bipolar disorder [13]. With regards to treatment, SSRIs lessen obsessive compulsive and aggressive symptoms in some patients [4]. However, there are case reports of increased aggression, food-seeking behavior or mania after starting an SSRI which may suggest underlying bipolar illness [10,11].

Methods: We performed a chart review of the relevant cases, documenting symptoms at presentation, medical management and subsequent response to therapy as based on symptom resolution.

Results: Three of five cases presenting with an episode of mania resolved with dose optimized ziprasidone, and two cases lessened with dose optimized risperidone. NAC lessened the degree of skin picking in all those exhibiting this preoccupation. The additional use of guanfacine to treatment regime lessened baseline aggressive tendencies in these patients.

Clinical Significance: This case series demonstrates bipolar disorder can be seen in adolescent as well as adults patients with PWS. SSRIs are the current mainstay psychiatric treatment for behavioral disturbances. However, this trend must be reevaluated for the PWS population as SSRIs have been documented to incite mania in some. Ziprasidone, a weight neutral atypical, may be a better option than others atypicals in preventing further manic episodes after an initial break when considering hyperphagia in PWS. This series highlights a diagnostic congruence between bipolar disorder in the general public and PWS population. Given the added burden of aggression in PWS, the common decade delay from symptom to diagnosis could lead to more morbidity in the PWS population compared to those without this syndrome.
DISTINGUISHING STROKE AND MIGRAINE FROM OCCIPITAL LOBE EPILEPSY IN A PATIENT PRESENTING WITH HEMIANOPIA AND COLORFUL FLASHING LIGHTS

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Category: Fellow

Introduction: Prevalence of occipital lobe seizures among patients with epilepsy is 2-10%. Visual phenomena occur as focal seizure in 80% of these patients and seen as flashing lights, complex visual hallucinations or ictal blindness. Cardinal symptoms are mainly visual or oculo-motor. Occipital seizure auras can also include abdominal and somatosensory phenomena.

Methods: Describe a case of occipital lobe epilepsy presenting with hemianopia and colorful flashing lights in left lower visual field. A 59-yr-old man with history of prior cerebrovascular accidents presented with episodes of green and red flashing lights in left lower quadrant of vision, headache, dense left homonymous hemianopia and was thought to be an acute stroke. He had blinking of eyes with left gaze deviation. He was given Ativan and loaded with Keppra with persistent refractory seizures, which was eventually controlled with Lacosamide. MRI Brain showed acute/hyperacute infarct involving right occipital lobe, punctate old left occipital lobe infarct and old right posterior frontal lobe infarct. Hyperacute infarct seen on MRI Brain was later thought to be seizure epiphenomenon. Video EEG showed numerous electroclinical seizures arising from right occipital region. Low voltage fast activity is seen in O1 and P4 > T6 region evolving to higher voltage sharp/spike activity. The patient is seen turning his head towards the left and reports seeing flashing lights. Seizure frequency was approximately 2 seizures per hour which decreased significantly after starting Lacosamide.

Results: MRI Brain showed acute/hyperacute infarct involving the right occipital lobe, punctate old left occipital lobe infarct and old right posterior frontal lobe infarct. The hyperacute infarct seen on MRI of brain was later thought to be a seizure epiphenomenon. Video EEG showed numerous electroclinical seizures arising from the right occipital region. Low voltage fast activity is seen in the O1 and P4 > T6 region evolving to higher voltage sharp/spike activity. The patient is seen turning his head towards the left and reports seeing flashing lights. Seizure frequency was approximately 2 seizures per hour which decreased significantly after Lacosamide was started.

Conclusions: Occipital lobe epilepsy is often misdiagnosed as migraine with auras or basilar migraine. High-resolution MRI is mandatory because it may detect a structural lesion requiring early attention and management. In midst of stroke and seizures, repeat diffusion-weighted imaging is clearly supported because DWI enhancement may resolve in follow-up imaging, distinguishing epiphenomenon from stroke. EEG is essential because in symptomatic cases background EEG is usually abnormal.
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Category of Submission: Fellow

Introduction: This was a retrospective chart review done to describe the epidemiology of latent tuberculosis infection (LTBI) in our patient population and also to assess the results of the Quantiferon TB Gold assay in children.

Methods: Retrospective chart review of all patients seen at the Pediatric Infectious Diseases Clinic outpatient for evaluation of a positive Quantiferon (QFT), tuberculin skin test (TST), TB exposure or recent diagnosis of LTBI. A case report form was used to collect data about patients in relation to multiple factors including country origin of birth, parent's origin of birth, other demographics, TB exposure and travel to an endemic area as well as work up done leading to evaluation/ diagnosis of LTBI including TST and QFT results. This was then collated into an Excel form and analyzed using SPSS.

Results: We reviewed 73 charts in all, with patient ages ranging from 2 months to 19 years. Demographic analysis revealed that the most frequent risk factor for LTBI evaluation was having foreign born parents or foreign birth and/or travel to high risk areas. There were 3 zip codes in Suffolk County that appeared most frequently and they correlated with exposure to specific regions: Asia (Bangladesh, India and Pakistan), South and Central America (El Salvador, Dominican Republic, Mexico, Guatemala and Columbia). We specifically assessed QFT responses in children under 5 years and over half of them (55%) made an adequate mitogen response and the correlation with TST in those with positive QFT was 100 percent.

Conclusions/Clinical Relevance: Although we had a small sample size, there did appear to be a correlation between certain zip codes and evaluation for LTBI which likely speaks to the clustering of families from different regions in the world. This is particularly important for public health purposes as it will help identify patients in our communities that should be more aggressively screened for and treatment of LTBI. We also saw that in our population including those less than 5 years, the QFT may be considered as an alternative to TST.
5-YEAR SURVIVAL AMONG EARLY STAGE LUNG CANCER PATIENTS TREATED BY SURGICAL RESECTION VS SBRT

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Title Category: Junior Faculty

Introduction: Lung cancer is the leading cause of cancer mortality worldwide, accounting for ∼1.3 million deaths each year. Fit patients diagnosed with early stage, non-small cell lung cancer (NSCLC) have traditionally been treated surgically. While current guidelines indicate that lobectomy is the suggested treatment option for patients in good overall health, Stereotactic Body Radiation Therapy (SBRT) is offered to patients with a compromised health status who may not be candidates for surgery. Recently, however, SBRT has been proposed as an alternative local treatment option for healthier patients with early-stage lung cancer. The primary objective of this investigation is to compare 5 year survival outcomes between healthy patients with clinical stage 1/II NSCLC treated with with lobectomy vs SBRT.

Methods: A retrospective study was conducted including 60 patients with biopsy-proven early stage disease treated between 2008-2012 who were identified through the Lung Cancer Evaluation Center database at Stony Brook Cancer Center. A total of 29 patients underwent resection and 31 received SBRT. SBRT patients were treated using the standard dosing regimen recommended by the American Society of Therapeutic Radiation. Recurrences of lung cancer were recorded and Kaplan-Meier curves and log-rank tests were used to assess 5-year survival differences between groups.

Results: A total of 5 events (recurrences) over 5 years occurred among patients undergoing lobectomy compared to 11 events among those receiving SBRT. The mean survival at 5-years after resection was 54.9 months +/- 2.3 months compared to 47.3 months +/- 3.3 months among the SBRT group. The log-rank test comparing treatments suggested that surgical patients may have improved outcomes after 5 years (p=0.10)

Conclusions: Findings from this preliminary investigation suggest that early stage NSCLC patients may benefit from surgical intervention compared to SBRT. Additional studies with larger samples are required to fully elucidate the potential benefit of lobectomy over SBRT.

IRB approval: 10/21/17 2016-3701F
BLUNTED CORTISOL RESPONSE TO DEXAMETHASONE-CORTISCOTROPHIN RELEASING HORMONE (DEX-CRH) IN EARLY ABSTINENT ALCOHOL DEPENDENT INDIVIDUALS: PRELIMINARY FINDINGS

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Submission Category: Faculty

Introduction: A dampened cortisol stress response has often been shown to be a marker of risk in alcohol dependent (AD) populations. However, the mechanisms underlying this dysregulation remain ambiguous. In the current study, we use a dexamethasone-CRH (DEX-CRH) paradigm alongside a dexamethasone-stress imagery (DEX-Stress) paradigm in abstinent alcoholics, to examine peripheral and central pituitary function, in the relative absence of the other.

Methods: Seven, 1-week abstinent, treatment-seeking AD individuals and 7 socially drinking controls were exposed to a physiological stressor (a bolus injection of 100 μg ovine CRF reconstituted in 2mL 0.9% of saline) and a psychological stressor (personalized guided imagery). One stressor was presented per day, across 2 consecutive days in a counterbalanced order. Each condition was preceded by a 1.5mg Dexamethasone (DEX) administration at 11pm the night before. Subjective measures of craving and negative mood were collected as well as plasma samples of cortisol and ACTH at baseline, following stress, and at various recovery time-points.

Results: No group differences were observed in ACTH response to either Dex-stress imagery or Dex-CRH. As expected, ACTH levels were elevated in both groups. Conversely, the AD group showed a significant Group X Condition interaction \[F1, 82 = 9.5, p=.003\] indicating a blunted cortisol response to Dex-CRH \((p<.02)\), but not to Dex-stress imagery, compared with controls. A significant Group X Condition X Time-point interaction \[F1, 81 = 3.1, p=.03\] also showed that while a significant craving response was observed in both groups to personalized stress, the physiological DEX-CRH stressor did not elicit a craving response in either group. Significant Group X Condition interactions for negative mood \[F1, 83 = 5.3, p=.02\] indicated that the DEX-CRH condition induced greater negative mood in the AD group compared with controls \((p=.05)\).

Conclusions: Findings suggest that cortisol suppression alongside normally-elevated ACTH levels in alcoholics may reflect peripheral adrenal insufficiency, with central pituitary function intact. This mechanism may also be related to alcohol craving, but only in the presence of a psychological stressor which broadly activates suprapituitary processes. Normalizing the cortisol response at the level of the adrenals may attenuate craving and negative reinforcing motivations for alcohol following psychological stress. These preliminary findings have broad implications for the development of better tailored medications for alcohol use disorders.

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CONCURRENT TRANSORAL ROBOTIC SURGERY (TORS) WITH NECK DISSECTION MAY OFFER LENGTH OF STAY BENEFIT IN THE TREATMENT OF HEAD AND NECK CANCER

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Submission Category: Resident

Introduction: Cancers of the head and neck may present with nodal metastasis that warrant neck dissection (ND). ND may be staged or performed concurrent in relation to Transoral Robotic Surgery (TORS), and the timing of ND is controversial. Proponents of staged operations cite decreased complications, including oropharyngocutaneous fistula or tracheostomy, the ability to re-resect positive margins, and improved robotic suite cost-utilization. Conversely, others perceive concurrent procedures to produce fewer complications and have a shorter length of stay or decreased cost. This study’s goal is to correct the paucity of multi-institutional outcomes data comparing concurrent versus staged ND in TORS.

Methods: Adults undergoing TORS with staged or concurrent ND from 2008-2014 were retrospectively identified in the New York Statewide Planning and Research Collaborative System database, which includes all Article 28 licensed inpatient and outpatient care facilities in New York State. We compared complications, readmissions, subsequent procedures and length of stay for concurrent versus staged procedures with multivariable logistic regression and multiple linear regression models.

Results: Of the 441 patients undergoing TORS and ND, 349 had concurrent and 92 had staged procedures. Risk-adjusted length of stay for concurrent procedures was 42.9% less than that of staged procedures (p <0.0001). ND timing was not associated with post-operative complications (p = 0.36), readmissions (p = 0.64) or additional procedures, including reconstruction, tracheostomy or gastrostomy (p = 0.89, 0.73, 0.12). Bleeding (8.2%) was the most common complication, and the majority (77.8%) required re-operation. Bleeding or surgical error was not associated with either concurrent or staged surgery (adjusted OR concurrent vs. staged = 0.71, 95% CI 0.37 to 1.41, p = 0.31).

Conclusions/Clinical Relevance: ND timing does not appear to impact post-operative surgical outcomes, except that length of stay is shorter for concurrent procedures. Cost and clinical benefits associated with length of stay are unknown, and it is reasonable to allow operator preference and patient factors to determine surgical logistics.

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PREDICTING ENDOTRACHEAL TUBE INSERTION DEPTHS IN NEONATES USING THE ORO-HELIX LENGTH

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Submission Category: Resident

Background: Improperly placed endotracheal tubes (ETT) contribute to neonatal morbidity. The conventional method used to predict ETT depths, also known as the 7-8-9 rule, is often inaccurate, especially among neonates weighing ≤1500g. We have identified a new measurement called the oro-helix length (OHL) that correlates directly with the ETT depth.

Objective: To evaluate the accuracy of the OHL in predicting the ETT depth in neonates. We hypothesize that the OHL is a better predictor of the optimal ETT depth than the 7-8-9 rule when compared to the CXR standard in neonates, especially among neonates weighing ≤1500g.

Study Design: Prospective study enrolling orally-intubated neonates without craniofacial anomalies or facial trauma. OHL was measured by two independent medical providers then compared on CXR to the ideal depth and the 7-8-9 rule depth. 75 subjects were needed to demonstrate a 0.5cm difference with 90% power and 2-tailed alpha of 0.05. Analysis of variance (ANOVA) with Bonferroni’s Multiple Comparison was used for analyses.

Results: 75 neonates weighing 470-4320g with gestational age 23-42 weeks were enrolled from April 2015-August 2016. The 7-8-9 rule overpredicted the ETT depth in neonates weighing ≤1500g (mean diff 0.76cm, p<0.001, 95%CI -1.2 to -0.28) with greater differences seen in neonates ≤1000g (mean diff 0.97cm, p<0.001, 95%CI -1.54 to -0.40). In neonates ≤1500g (Figure 1), there was no difference between the ideal depth and the left OHL (mean diff 0.01cm, p>0.05, 95%CI -0.49 to 0.47) or right OHL (mean diff 0.03cm, p>0.05, 95%CI -0.51 to 0.45). In neonates ≤1000g (Figure 2), no difference was seen between the ideal depth and the left OHL (mean diff 0.01cm, p>0.05, 95%CI -0.49 to 0.47) or right OHL (mean diff 0.03cm, p>0.05, 95%CI -0.51 to 0.45). For neonates >1500g (Figure 3), there was no difference among the ideal depth, left OHL (p>0.05, 95%CI -0.39 to 0.53), right OHL (p>0.05, 95%CI -0.43 to 0.49), or 7-8-9 rule (p>0.05, 95%CI -0.62 to 0.31).

Conclusion: OHL is a better predictor of the optimal ETT depth in VLBW (≤1500g) and ELBW (≤1000g) neonates than the 7-8-9 rule. The 7-8-9 rule significantly over-estimated the ETT depth in these neonates.

SBUH IRB Committee on Research Involving Human Subjects (CORIHS): 2015-2961-R1
DISSECTING THE ROLE OF BATF3-DEPENDENT DENDRITIC CELLS AFTER ORAL LISTERIA MONOCYTOGENES INFECTION

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Title Category: Graduate Student in Molecular and Cellular Biology

Introduction: Defense of the intestinal mucosa against pathogen invasion is dependent on the interaction of a variety of immune cells that function in concert to resolve infection and promote protective immunologic memory. Mounting the appropriate adaptive immune response relies on interactions between dendritic cells (DC) and T cells to prime a robust cellular response. During Listeria monocytogenes (LM) infection, both the infection and subsequent immune response are dependent on distinct DC subsets. These DCs can largely be subdivided into subsets that are transcription factor Batf3-dependent (CD8α+) or Batf3-independent (CD11b+). In this study, we examined the role of these two DC subsets in the intestinal mucosa after oral LM infection.

Methods: Batf3⁻/⁻ or wild-type Balb/c mice were orally infected with murinized LM to dissect the role of Batf3-dependent and -independent DC subsets. Bacterial burden or T cell and DC responses were subsequently examined from intestinal tissues at early time points after infection.

Results: After oral LM infection, dissemination of LM from the gut to the intestine-draining mesenteric lymph nodes (MLN) occurred via intracellular carriage. Batf3-dependent DCs were required for optimal LM accumulation in the MLNs 3 days after oral infection. However, loss of Batf3-dependent DCs did not affect colonization of the gut and early dissemination to the MLN at 1dpi. Furthermore, FACS-sorted Batf3-independent CD11b⁺ DCs from MLNs early after infection had a higher bacterial burden than other Batf3-dependent or -independent subsets. Finally, the presence of Batf3-dependent DCs was determined to be crucial for induction of an appropriate antigen-specific T cell response. Collectively, these data suggest that LM travels to the MLN within CD11b⁺ DCs where LM gains access to Batf3-dependent DCs to replicate in a preferred environmental niche and promote T cell activation.

Conclusion: Batf3-dependent and independent DCs play a crucial role in the MLNs during distinct phases after oral LM infection. Ultimately, these DCs are important both for promoting bacterial pathogenesis and eliciting protective immunologic memory. Targeting specific components of these pathways may allow the induction of memory populations while limiting bacterial dissemination of LM-based cancer vaccines.

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MECHANICAL SIGNALS MITIGATE INTERMUSCULAR FAT ACCUMULATION CAUSED BY HIGH-FAT DIET

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Introduction: Skeletal muscle insulin resistance (IR) and intermuscular fat are hallmarks of type II diabetes and contribute to poor muscle quality. To combat IR, exercise and other mechanical signals such as low intensity vibration (LIV) can be anabolic to muscle and reduce indices of fat, leading to improved insulin sensitivity. We aimed to identify mediators of high-fat diet induced IR, determine if bone marrow (BM) cells play a role in intermuscular adiposity, and if LIV can mitigate these complications. We hypothesized mice fed a high-fat diet would have higher concentrations of intermuscular lipids with minimal contribution of BM cells to skeletal muscle tissue, while LIV would mitigate the accumulation of fat.

Methods: Following lethal irradiation, 8w male C57Bl/6J mice received intravenous GFP+ bone marrow transplants (BMT). BMT mice were fed a 45% high fat (HD, n=20) or 10% regular (RD, n=19) diet for 10w. Age-matched controls were sham irradiated and given saline injections (AC, n=10). At 2w, 50% of mice from each diet group were subjected to LIV treatment (RDV and HDV, n=10 each) at 0.25g and 90Hz for 30min/d and 5d/w. We evaluated the musculature using histology, ELISA, RT-qPCR, and flow cytometric analyses.

Results: Histological analysis of lipid content using oil red O staining showed a marked increase (716%) in lipids in HD animals relative to RD (p<0.01), and a 260% increase in HD relative to RDV (p<0.01). Interestingly, HDV lipid content was 54% lower than HD (p=0.06), demonstrating LIV modulated the accumulation of intermuscular fat. Engraftment of BM cells following BMT analyzed via flow cytometry show minimal BM cell engraftment in skeletal muscle tissue (<0.5% in all groups) compared to other tissues such as blood (27-40%) and fat (21-30%). Gene expression analysis indicated disruption in the insulin-signaling pathway, with PKCθ upregulated in HD by 56% (p<0.05) compared to RDV and no changes in HDV.

Conclusions: These data demonstrate that high-fat diet in the mouse increases both intermuscular fat and indications of impaired insulin signaling while mechanicals can mitigate these effects. BM cells do not play a major role in the function or formation of skeletal muscle, and, despite the marrow’s close proximity, BM cells are not contributing to fat accumulation. LIV is therefore a non-invasive, therapeutic intervention that may be effective in treating musculoskeletal complications related to type II diabetes in the clinic.

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GENE DELIVERY TO MAMMALIAN CELLS USING A GRAPHENE NANORIBBON PLATFORM

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Submission Category: Postdoctoral Fellow

Introduction: The two-dimensional carbon nanostructure, graphene, has shown potential as a multifunctional scaffold for a large number of biomedical applications including gene delivery. We recently developed oxide graphene nanoparticles (O-GNRs) that can serve as a non-viral gene delivery vector to cells overexpressing epidermal growth factor receptors (EGFRs). However, neither the factors that influence DNA loading onto O-GNRs nor their ability to deliver DNA into other cell types has been sufficiently explored. This study sought to examine the factors that influence DNA loading onto O-GNRs, the cytotoxicity of O-GNRs, and the viability of gene expression upon delivery of the complex of linear double stranded DNA (dsDNA) and O-GNRs to a mammalian cell.

Methods: O-GNRs were synthesized using the oxidative longitudinal unzipping of multi-walled carbon nanotubes (MWCNTs). Physical properties of O-GNR were examined using Transmission Electron Microscopy (TEM), absorption spectrometry, Raman spectroscopy, and Fourier Transform Infrared spectroscopy (FTIR). The amount of DNA loading was determined in a multistep process. After washing DNA-loaded O-GNR pellets extensively with physiological relevant buffer, the extracted DNA:O-GNR complex was resolved by agarose gel electrophoresis and the DNA content was visualized using Ethidium Bromide staining. To measure O-GNR induced cell cytotoxicity, the release of Lactate Dehydrogenase (LDH) was measured and a trypan blue exclusion assay was employed. The amount of transgene expression by the loaded DNA was determined using fluorescence microscopy and flow cytometric analysis.

Results: We report that O-GNRs, without additional functionalization with polycations or liposomes, can stably bind dsDNA as large as 6 kb in a physiological buffer. The bound DNA can be released from O-GNR upon translocation of the DNA:O-GNR complex as evidenced by expression of the encoded reporter gene in mammalian cells. Importantly, we found O-GNR induced minimal cell death in any of the LDH, trypan blue exclusion, and apoptosis cell staining assays. Thus, O-GNR exhibits low cell toxicity while delivering transgene expression into mammalian cells.

Conclusions: Our data supports that O-GNR could serve as an alternative, non-viral, gene delivery platform. O-GNR promises a new way of gene delivery with larger genome size of transgene cargo capability than many viral vectors. In addition, functionalization of O-GNR with specific engineering modifications could further enhance its avidity and specificity, enabling targeted gene delivery.

Funding Source: Stony Brook Discovery Prize
INTRODUCTION: Carbapenems have been considered the last-line treatment for infections caused by multidrug resistant bacteria. However, increasing cases of carbapenem-resistant Klebsiella pneumoniae (CR-Kp) have been reported worldwide. New strategies to combat this problem has led to the development of passive immunotherapy, i.e. antibodies (Ab). Abs can act as substitutes to enhance the immune system. Our lab investigates whether anti-capsular Abs are effective against Kp through observations of agglutination assays. This would indicate that antibody-opsonized bacteria could be recognized by phagocytic cells and eventually be protective. Most of the CR-Kp strains are characterized by MLST to belong to the ST258 clone. ST258 comprises of two distinct lineages, clade 1 and 2 depending on their capsular polysaccharide structure. An effective passive immunotherapy would be one able to target and recognize both clades within the ST258 clone.

METHODS: 17H12 (IgG1, IgG3) and 8F12 (IgG1, IgG3) anti-clade 2 Abs and 4A7 (IgG1), 5C7 (IgG2a), 9D8 (IgG1) and 14D11 (IgG2b) anti-clade 1 Ab were used. 1.5x10^8 CR-Kp CFUs with PBS were incubated with or without mAbs for 1 hour at room temperature. Agglutination was observed by microscopy.

RESULTS: Assays demonstrated agglutination in all 42 clade 1 and clade 2 strains from Montefiore and Stony Brook Hospitals with Ab 17H12 (IgG3), an originally anti-clade 2 produced Ab. This Ab was class-switched to IgG1, and this variant continued to show agglutination in 7/8 clade 2 strains and 5/9 clade 1 strains. 8F12 (IgG3), anti-clade 2 Ab, agglutinated with all clade 2 strains and 8/16 clade 1 strains; whereas when it was isotype-switched to IgG1, 6/8 clade 2 strains and None of the clade 1 strains were agglutinated. When anti-clade 1 Abs were tested, only 1/26 clade 2 strains agglutinated with 4A7, and 4/26 for 5C7, 9D8 and 14D11. Of the 16 clade 1 strains, 3/16 agglutinated with 4A7, 1/16 with 5C7, 10/16 with 9D8, and 8/16 with 14D11.

CONCLUSIONS/CLINICAL RELEVANCE: Our lab has generated 8 different CR-Kp specific Abs that differ in their ability to agglutinate clade 1 and 2 CR-Kp strains. IgG3 anti-clade 2 Abs seem to cross-react across clades much better than anti-clade 1 Abs. Ab class isotype-switching seems to affect the ability of cross-react with the 2 different clades. Further research is necessary to decipher whether their polysaccharide binding affinity has decreased. A cross-reactive 17H12 (IgG3) is a promising candidate for passive immunotherapy against CR-Kp infections. Future research will continue to characterize its in vitro and in vivo protective efficacy.

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LIMBERG TRANSPOSITION FLAP RECONSTRUCTION FOR PILONIDAL SINUS DISEASE

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Submission Category: Medical Student

Purpose: Rhomboid excision and closure with a Limberg transposition flap is one of the most reliable and successful methods of treating pilonidal sinus disease. The efficacy of Limberg flap reconstruction for pilonidal disease has not been evaluated with regard to clinical presentation. We performed this study to determine if Limberg flap reconstruction is as effective for pilonidal disease with associated abscess as it is for disease without abscess formation.

Methods: Sixteen patients underwent rhomboid excision and Limberg flap reconstruction for chronic pilonidal sinus disease, performed by a single surgeon over a seven-year period. Patient demographics, clinical presentation, wound characteristics, complication rates and the need for revision surgery were recorded and compared.

Results: Three out of sixteen patients (3/16 or 18.7%) underwent the surgery for pilonidal disease with abscess (Group 1) and thirteen underwent the surgery for disease without abscess (13/16 or 81.2%; Group 2). Patient demographics (age and % male) were similar between the two groups. The defect size after rhomboid excision was larger in Group 1 compared to Group 2 (111.7 ± 73.2 cm² versus 53.6 ± 33.3 cm²; p=0.046). The complication rate tended to be higher in Group 1 (3/3 or 100%) compared to Group 2 (4/13 or 31%), although this difference was not significant (p=0.062). All three patients in Group 1 developed a postoperative complication of partial wound dehiscence, and all three cases were managed conservatively with local wound care, without the need for revision surgery. Two of the four complications in Group 2 were wound infections and the other two were partial wound dehiscence. Only one of the patients who developed a postoperative wound infection in Group 2 required drainage and revision surgery. The other three patients were managed conservatively with local wound care.

Conclusions: Limberg flap reconstruction is safe and effective for pilonidal disease with and without abscess formation, and may avoid the pain and cost associated with a prolonged local wound care regimen. The rate of postoperative partial wound dehiscence is likely to be higher if the surgery is performed in the setting of acute abscess formation. However, this type of complication can be managed conservatively, without the need for revision surgery, and operating in this setting can produce long-term resolution of the problem.
SURGICAL SPECIALTY CHOICE: PERCEPTIONS ON CHOOSING SURGICAL SPECIALTIES

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Submission Category: Medical student

Introduction: Throughout the last decade there has been an increase in percentage of women that enter surgery and surgical specialties. Even though the higher percentage, women tend to favor certain surgical subspecialties. In addition, women still hold only a minority of leadership positions both at the institutional and the national level. Previous research has sought to investigate why fewer women pursue careers in surgery, however, has not looked at differences among the various surgical subspecialties. We sought to investigate the influences that affect the choice of female surgeons to pursue a particular surgical specialty.

Methods: Following Institutional Review Board approval, we administered an 18-question survey (Figure 1) to members of the American College of Surgeons (ACS) through their monthly newsletter NewScope. Surveyors included residents and faculty. Qualtrics (Provo, UT) was used for the distribution of survey.

Results: Preliminary results of the study include 468 responses. From these responses, 330 (71.43%) were male and 132 (28.42%) were female participants. The largest percentage of respondents are between 30-39 years old (28.70%), followed by 27.37% between 40-49 years old, 19.21% >60 years old, 16.11% between 50-60 years old, and 8.61% <30 years old. When asked if participants had a role model, 60.88% reported having a male role model, while 9.45% had a female role model, and 29.67% did not report a role model. Respondents were asked to identify subspecialties that they consider to be most open to men and most open to women and how they would advise men and women pursuing an academic career. Among the 23 surgical subspecialties listed 81.04% of respondents said that Breast surgery was among the specialties most open to women. Additionally, very few participants reported having a female role model. Further analysis will seek to investigate response trends and uncover any significant differences in responses.

Conclusion: This is the first survey to examine perceptions about influences that affect female choice in choosing surgical subspecialty. It appears that majority of respondents perceive breast surgery to be more open to women. Additionally, very few participants reported having a female role model. Further analysis will seek to investigate response trends and uncover any significant differences in responses.

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MATERIAL ANTENATAL CORTICOSTEROID THERAPY BETWEEN 30 AND 34 WEEKS GESTATION AND NEONATAL MORBIDITY IN LATE PRETERM AND EARLY TERM INFANTS

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Submission Category: Fellow

Background: Preterm birth (PTB) significantly contributes to neonatal morbidity/mortality, with late PTB accounting for the majority. ACT significantly reduces Respiratory Distress Syndrome, and other comorbidities in infants born before 32 weeks gestation, but it is not clear if there are benefits to late preterm/early term (34-36.6 and 37- 37.6 weeks) neonates if they had received ACT before 34 weeks

Objective: To examine whether ACT between 30-34 weeks improves morbidity in infants born between 34 to 37.6 weeks

Design/Method: This is a retrospective cohort study of infants born between 34-37.6 weeks at Stony Brook University Hospital and admitted to the Neonatal Intensive Care Unit during 2013-2015. Multiple logistic regression models were employed to examine whether ACT exposure (vs. non-exposure) was significantly associated with the probability of neonatal respiratory and metabolic comorbidity. Covariates include gestational age and presence of maternal diabetes, hypertension or chorioamnionitis

Results: 555 infants delivered during the late preterm or early term period were included with 10% exposed during our study period. The SNAPPE II scores, used for objective comparison of illness severity were relatively low for both steroid exposed infants, mean=6.0(7.8) and steroid unexposed infants, mean= 7.0 (9.6)(p=0.14). Overall, improved respiratory and metabolic comorbidities were not significantly associated with ACT exposure or non-exposure (all p’s > 0.06) after adjusting for all covariates. Next, we examined infants exposed to ACT between 32-33.6 weeks and delivered between 34-35.6 weeks, with 11.9% of the 420 exposed. There was no association between steroid exposure and respiratory outcome of these infants (all p’s>0.05). There was a trend towards having adverse metabolic outcomes in those that received steroids between 32-33.6 weeks and delivered between 34-35.6 weeks(p= 0.06,95% CI 0.24-1.04).

Conclusions: ACT between 30 and 34 weeks did not influence respiratory morbidity of infants born between 34 and 37.6 weeks regardless of timing of exposure and delivery. However, our cohort of babies that received ACT at 32-33.6 weeks showed an association towards adverse metabolic outcome. Subsequent analysis will include whether ACT exposure influenced delivery room resuscitation. Past studies have emphasized the respiratory benefits of antenatal steroids to infants born at earlier gestational ages, but questions remain as to whether neonates born at later gestations benefit as well.
NASAL INTERMITTENT MANDATORY VENTILATION (NIMV) VERSUS NASAL CONTINUOUS POSITIVE AIRWAY PRESSURE (NCPAP) IN STABLE PRETERM INFANTS: DOES NASAL INTERMITTENT MANDATORY VENTILATION PROVIDE IMPROVED VENTILATION AND CARDIORESPIRATORY STABILITY?

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Introduction: NIMV is a frequently used mode of non-invasive respiratory support in preterm neonates. No previous studies have determined optimal NIMV settings in the very low birth weight (VLBW) infant population. Our objective is to use transcutaneous CO2 (TcCO2) monitoring to determine safe and effective NIMV settings which will provide improved ventilation and cardiorespiratory stability.

Methods: To validate TcCO2 monitoring, we first performed a correlation study between serum PCO2 and TcCO2 (SenTac AG, Switzerland), in VLBW infants with an umbilical arterial catheter in place. For the remainder of the study, VLBW infants were included, if requiring NCPAP or NIMV, with FiO2 <35%, and on caffeine. Infants were excluded if FiO2 >35%, with signs of clinical sepsis, hemodynamic instability, or major congenital anomalies. Infants were then exposed to NIMV with varying inspiratory pressures above PEEP (10, 15, 20 cm H2O), while holding all other ventilator parameters constant. We then varied inspiratory times (0.3, 0.4, 0.5 seconds). Finally patients were randomized to alternating one hour study periods using CPAP and NIMV. Our primary outcome variable was time-weighted (TW) TcCO2.

Results: Results demonstrated a positive correlation between TcCO2 and PCO2 (R² = 0.83) and included 70 paired measurements from 20 VLBW infants (gestational age (GA): 26.6 ± 2.2 weeks, birth weight (BW): 921 ± 296g). Preliminary results from a Bland Altman analysis indicate that readings for TcCO2 monitoring are generally higher than PCO2, with a mean difference (or bias) of 2.68 (SD =4.71) between the two. Ninety-two percent of the differences are within 2 SDs of the mean (limits of agreement: -6.74 and 12.1). Thirty-two clinically stable preterm infants requiring NIMV or NCPAP, (GA: 28.6 ± 2.0 weeks, BW: 1100 ± 249g), were included to assess the effects of varying inspiratory pressures and inspiratory times on TcCO2. Optimal NIMV settings varied per patient and TW TcCO2 did not vary significantly with incremental increases in settings. There was no clinically significant difference in TW TcCO2, oxygenation, respiratory rates and heart rates on NCPAP or NIMV during the study periods.

Conclusion: In summary, TcCO2 can be useful in estimating PCO2 in the VLBW population. Short-term use of NIMV is comparable to NCPAP with respect to ventilation and maintenance of cardiorespiratory stability.

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PREVALENCE OF CORONARY ARTERY DISEASE IN PREMENOPAUSAL WOMEN PRESENTING WITH ACUTE CHEST PAIN EVALUATED WITH CORONARY CT ANGIOGRAPHY

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Submission Category: Faculty

Purpose: The purpose of this study was twofold, one to identify the prevalence of CAD in premenopausal women who present to emergency department (ER) with acute chest pain and have negative troponins, as identified on Coronary Computed tomography angiogram (CCTA). The second was to identify the various risk factors that were strongly associated with a positive study.

Method and Materials: We retrospectively evaluated the CCTA and medical records in 498 consecutive patients who presented to our ER with acute chest pain and underwent CCTA. The various parameters evaluated were age, family history, diabetes, hypertension, obesity (BMI), hyperlipidemia and smoking. The calcium score was documented and the CCTA results were categorized as normal, nonobstructive, borderline and obstructive CAD. We used Chi square test to examine marginal association. Possible risk factors that were significantly associated p<0.01 were then further evaluated by multivariable regression analysis.

Results: In this study of the patients were in the age range (mean age 46±6 yrs). Of these 498 patients a total of 106 (21%) had CAD; 85 (17.07 %) had non-obstructive CAD, 11(2.2%) had obstructive CAD and 10 (2%) had borderline obstructive CAD. Increasing age was associated with higher incidence of CAD (p 0.0070). Hypertension (p 0.004), hyperlipidemia (p 0.05), family history (p0.01), diabetes (0.0001) and obesity (p 0.0001), smoking (p 0.0006) were significantly associated with presence of CAD on CCTA. The strongest risk factors for presence of CAD were age (p .0013), diabetes (p 0.0067) and obesity (p .0014) on multivariable regression analysis. Calcium score was an average of 0.47±8 in normal compared to 607.5± 520 in obstructive CAD.

Conclusion: The prevalence of CAD in premenopausal females presenting to the ER with chest pain is 21.2 % as diagnosed by CCTA. The risk factors strongly associated with presence of CAD and a positive CCTA were increasing age, diabetes and obesity. Women under 35 years of age had no identifiable CAD on CCTA in our study.

Clinical Relevance/Application: Coronary artery disease (CAD) is major cause of death in women, with rising mortality from myocardial infarction in women compared to declining mortality in men. There is very low awareness for the prevalence of CAD in younger women among physicians and patients alike partly contributing to adverse outcomes. It is therefore important to identify the burden of CAD in younger women by non-invasive testing such as CCTA to decrease the mortality and morbidity.

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HYPOXIA UNDERLIES THE DEVELOPMENT OF ‘CHEMOBRAIN’ IN RATS ADMINISTERED A BREAST CANCER ADJUVANT CHEMOTHERAPY REGIMEN

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Abstract Category: Faculty

Introduction: Chemotherapy-induced cognitive impairment (CICI or ‘chemobrain’) is well documented in cancer patients and manifests with long-lasting cognitive deficits and impaired short-term memory. The relatively small number and heterogeneity of patients enrolled in clinical trials hamper progress towards elucidating the mechanisms of CICI. Proposed hypotheses include neuroinflammation, oxidative stress and hypoxia. Likely, more than one of these underlie either short- or long-term CICI symptoms, possibly contributing to a different extent, depending on the age, gender, co-morbidities and genetic background of the patients. Animal models allow working in a less heterogeneous system with higher parameter control and are therefore useful in dissecting out complex and multifactorial pathophysiological disorders, such as CICI. In order to gain insight into these mechanisms, we established a rat model of chemobrain and analyzed the transcriptome changes following chemotherapy and CICI induction in cortex and hippocampus.

Methods: Rats were administered chemotherapy drug regimen used on breast cancer patients (doxorubicin and cyclophosphamide, weekly, 2 and 50 mg/kg/day, respectively). The Barnes’ maze and Novel Object Recognition tests were used to assess cognitive impairment. RNA was extracted from the cortex and hippocampus and used for RNA sequencing to identify candidate genes involved in the pathophysiology of CICI. Putative positive genes were validated by real time PCR.

Results: The chemotherapy regimen resulted in induction of CICI in the rats, which manifested in a clear impairment in learning new tasks and in a deficit in short-term (within the 24 hours) memory, relative to control animals, who received saline injections. Three genes, Hemoglobin α, Hemoglobin β and Alas2 (encoding an enzyme, which initiates heme biosynthesis) were differentially expressed (upregulated) in the cortex and hippocampus of CICI animals, compared to controls. These changes started to decline three weeks after the cessation of chemotherapy.

Conclusions/Clinical Relevance: Previous studies have shown that upregulation of the Hemoglobin genes in neurons is an adaptation to hypoxia. Our findings suggest that hypoxia may underlie CICI in this model. The data also show an absence of neuroinflammation following chemotherapy drug treatment, suggesting that inflammation may not underlie short-term CICI, at least in young individuals. These results may lead to more effective therapies that can minimize CICI. In future work the model can be modified to dissect out the molecular mechanisms of CICI in older individuals and the long-term effects of drug treatment.

Funding Source: Carol M. Baldwin Breast Cancer Research Award
ROLE OF AUTONOMY, CONSENT AND ASSENT IN ADOLESCENT CANCER SYNDROMES

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Category: Residents

Objectives:
1. To understand the role of patient autonomy for optimal treatment for adolescents with cancer
2. Understanding barriers in involving palliative care teams and conducting advanced care discussions for adolescents with life-threatening conditions, including clinician, family, and patient-specific factors

Background: Lynch Syndrome is an autosomal dominant disorder caused by a germline mutation of one DNA mismatch repair (MMR) gene or loss of expression of MSH2. Individuals with biallelic Lynch Syndrome are at high risk of colorectal cancer, and can also develop endometrial cancer, malignancies of ovary, stomach, small bowel, hepatobiliary system and brain.

Case Description: SM is an 18 year old Caucasian woman with biallelic Lynch Syndrome, diagnosed at 12 years old. Since diagnosis, she has had: Glioblastoma multiforme, transitional cell carcinoma of bladder, Grade 1 endometrial cancer, recurrent Stage I adenocarcinoma of the colon and recurrent ovarian carcinoma.

SM is fully aware of her diagnosis and has been involved in all decision making including whether to have surgery for her ovarian carcinoma. She declined hysterectomy (due to a desire to preserve the ability to carry a pregnancy) and colectomy and ileostomy although it was explained that it would eliminate future recurrence of colon carcinoma. SM is fully aware that she is likely to keep developing new malignancies, a process that may be accelerated by chemotherapy and radiation.

Conclusion: Adolescent cancers pose a threat in terms of autonomy, consent and assent in treatment. However, normal psychosocial development may be impaired in chronically ill adolescents, despite attaining the legal age of consent. This problem may be compounded in patients like SM, who have a poor prognosis and a high likelihood of significant morbidity. For patients such as SM, palliative care and oncology teams should work closely with the patient and family from the time of diagnosis to assess the patient’s level of decisional capacity and ability to understand the broader goals of care.
IDENTIFYING FACTORS IN IMPLEMENTATION OF A PATIENT SELF-MANAGEMENT WELLNESS CLINIC

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Introduction: The purpose of this project was to survey health care providers in the Northport Veterans’ Hospital to determine barriers in patient attendance at the Wellness Clinic, a clinic aimed at promoting personal health planning and lifestyle behavior modification. Successful implementation of self-management initiatives, such as this clinic, is an important aspect of care given their effect of increasing health quality.

Methods: A survey designed to assess provider referral rate, barriers to referral, and potential resolution methods to increase referral success were collected. Analysis of these results were performed with Microsoft Excel.

Results: A total of 31 providers were surveyed with professional designations as follows: 13 nurses, 12 medical residents, 3 medical attendings, 1 nurse practitioner, 1 social worker, and 1 health tech. In total, 45.2% (14/31) of healthcare providers have spoken to a patient about the Wellness clinic with None of these being residents. On average, those that have ever spoken to a patient about the clinic do so in 39.2% of their visits. Of these, the professional designations were nurses (36%), attending physicians (30%), with other designations less except for health tech (99%). Main barriers to patient referral in those aware of the Wellness clinic were time constraints during visit (9/21; 38.1%) and that the patient was not interested in discussing (8/21; 31%). Majority of providers (30/31) were interested in at least one means of additional education about Wellness clinic and personal health planning with the most preferred method being a provider guide.

Conclusion: Personal health planning and lifestyle behavior modification is an important measure in prevention of disease. Promotion of these resources could be augmented by increased awareness of wellness resources in underutilized populations, such as residents. Additionally, clinical time constraints and patients’ interests are two areas to target when initiating similar programs. Clinical guides to educate providers and team-based approaches to spread responsibilities of patient wellness approaches, such as promotion through health technicians, are potential means of increasing success of patient self-management initiatives.

Acknowledgement: Survey was done with the support of Lead Wellness Clinic Clinicians, Mary Cavanagh, MD, MPH and Joanne Taylor, PhD.
ACCURATE AND RELIABLE FAT-WATER MRI BREAST DENSITY MEASUREMENTS

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Introduction: Breast density (BD) is a radiologic (image-based) measure of the proportion of fat to fibroglandular tissues in the breast where higher BD is a risk factor for breast cancer¹. As such, the accurate measurement of BD has emerged as a priority for assessing breast cancer risk. Currently, mammography is the most widely used method of BD determination (MG-BD) but the ionizing radiation prohibits its use in studies requiring frequent monitoring. BD derived from fat-water decomposition MRI (FWMRI-BD) has been proposed² for BD quantification without ionizing radiation. We developed an optimized FWMRI-BD measurement that is automated, more accurate and reliable.

Methods: MRI scans were performed on a 1.5T GE Signa NV-CV/i scanner using an axial radial GRASE acquisition³ and a 3T Siemens Skyra using an axial Cartesian 6-echo gradient-echo pulse sequence. Total acquisition time was < 5min and quantitative fat fraction maps of the entire breast were generated. A validated automated breast segmentation⁴ was applied. FWMRI-BD was initially calculated by a published measure Fra80², representing the ratio of breast voxels with <80% apparent fat fraction. We propose a new FWMRI-BD measure, FraGW. It accounts for the total amount of fibroglandular tissue (FraG) and water content(FraW) in the breast, and mathematically corrects for fat-water signal bias due to intrinsic limitation of the fat-water separation technique. To test the accuracy of FWMRI-BD, 50 patients undergoing digital MG within 6 months from the date of MRI scan were identified and MG-BD was assessed using a well-established method (Cumulus)⁵. Pearson correlation was performed. To test the reliability of FWMRI-BD, 26 repeated scans from 10 patients were identified. For each repeated scan, the patient completely left the scanner and was repositioned. ∆¹⁻² (difference between test-retest FWMRI-BD) and intra-class correlation(ICC)⁶ were evaluated.

Results: The fat fraction map, Fra80 mask, FraG mask, corrected FraW map are shown in Figure 1(a)-(d). All statistical analyses are shown in Table 1. Both FWMRI-BD measures were strongly correlated with MG-BD and exhibited superior test-retest reliability (ICC>0.98) compared to MG-BD (reported intrareader ICC 0.82-0.97)⁷. FraGW showed improvement over Fra80.

Conclusion: The proposed automated FraGW measure, which quantifies the entire fibroglandular and water content of the breast, is more accurate and reliable than the previous FWMRI-BD method. This enables the possibility of early detection of BD changes for clinical trials and treatment response assessment.

Figure 1 A representative breast slice from GE scanner. (a) fat fraction map, (b) Fra80 mask, (c) FraG mask, and (d) FraW map after correction for fat-water signal contamination. Yellow regions in (b) and (c) indicate the dense areas with <80% fat fraction and the fibroglandular tissue, respectively.
Table 1. Accuracy and Reliability of the FWMRI-BD measures (* P-values << 0.0001)

<table>
<thead>
<tr>
<th></th>
<th>FWMRI-BD</th>
<th>Fra80</th>
<th>FraGW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson correlation coefficient with MG-BD</td>
<td>R= 0.84*</td>
<td>R=0.92*</td>
<td></td>
</tr>
<tr>
<td><strong>Test- retest reliability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean $</td>
<td>\Delta_{1-2}</td>
<td>$</td>
<td>0.0174</td>
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<tr>
<td>standard deviation $\Delta_{1-2}$</td>
<td>0.0214</td>
<td>0.0146</td>
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<tr>
<td>dynamic range</td>
<td>0.0902 - 0.6601</td>
<td>0.0735 - 0.6696</td>
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<tr>
<td>standard deviation $\Delta_{1-2}$/dynamic range</td>
<td>3.8%</td>
<td>2.4%</td>
<td></td>
</tr>
<tr>
<td>ICC [95% confidence interval] (logarithm)</td>
<td>0.9870 [0.9715,0.9941]</td>
<td>0.9901[0.9783,0.9955]</td>
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</tr>
</tbody>
</table>

**Funding Sources:** This work is partially supported by NIH grants CA149417, CA161534.

**Human subjects:** The data used in this study are anonymized image data from another site.

**Financial disclosures:** There are no conflicts of interest to declare.

KRÜPPEL-LIKE FACTOR 5 REGULATES THE REGENERATION OF THE INTESTINAL EPITHELIUM POST-IRRADIATION INJURY

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Submission Category: Graduate Student

Introduction: Ionizing radiation (IR) is a commonly used therapy against various malignancies. Intestines are particularly vulnerable to IR damage due to its proliferative capacity and position in the body, making gastroenterology side effects inevitable. B-cell-specific Moloney murine leukemia virus integration site 1 (Bmi1) resides at the +4 position of the crypt, serving as the "reserve" stem cells. Bmi1+ cells are tolerant to IR damage due to their quiescence and contribute to post-IR intestinal regeneration. Krüppel-like factor 5 (KLF5) is a zinc-finger transcription factor expressed in the proliferative cells of intestines, regulating cell proliferation and differentiation. However, the role of KLF5 in post-IR intestinal regeneration has not been evaluated. Our study aims to investigate the role of KLF5 in the regenerative response after radiation injury in the intestinal epithelium.

Methods: Wild type (WT) and Bmi1-CreER; Rosa26r-eYFP (Bmi1-eYFP) mice were exposed to whole-body γ-irradiation with a 137Cs source with a total of 12 Gy. Tamoxifen was administered 48 hours before irradiation in Bmi1-eYFP mice to induce recombination in Bmi1+ cells. Intestinal tissues were collected at different time points and examined by immunohistochemistry.

Results: Normal intestinal morphology was observed 6 hours post-irradiation in small intestines of WT mice, and Klf5 expression was indistinguishable to non-irradiated mice crypts. However, Klf5 expression was reduced 48 hour and started to reappear 72 hours post-irradiation, which the expression pattern correlated with the expression of Ki-67 during 48 and 72 hours post-irradiation intestinal regeneration, respectively. The robust increase in Klf5 expression in regenerating crypts was confirmed using Bmi1-eYFP mice. Under normal condition, each crypt harbors about 7-8 Bmi1-lineage cells 6 days after tamoxifen treatment. However, at 6 days post-tamoxifen treatment and 96 hours post-irradiation, the number of Bmi1-lineage cells increases to about 89 cells per crypt. Among the lineage cells, approximately 90.1±0.94% cells expressed Klf5.

Conclusions: Klf5 is expressed in proliferating cells of regenerating intestinal crypts post-irradiation. These results indicate Klf5 has a functional role in post-irradiation intestinal regeneration. The experiment to determine the effect of Bmi1+ cell-specific deletion of Klf5 on post-irradiation intestinal regeneration is ongoing. Further exploration is necessary to determine the mechanism of Klf5 as a regulatory factor in ISCs during post-irradiation intestinal regeneration.
ROUTE OF IMMUNIZATION DICTATES
INTESTINAL TISSUE-RESIDENT
MEMORY CD8+ T CELL DEVELOPMENT

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Submission category: Post-doctoral Fellow

Introduction: The gastrointestinal (GI) tract represents the largest surface area that directly contacts with the external environment and is constantly exposed to pathogenic microbes. Memory CD8+ T cells play a critical role in protective immunity against intracellular pathogens at the intestinal mucosa. A newly identified subset of memory CD8+ T cells called tissue-resident memory T (T*Rm) cells do not circulate throughout the body but permanently resides in peripheral tissues. The positioning of CD8+ T*Rm cells at barrier sites allows them to respond immediately to pathogen re-encounter and mediate protective immunity through direct lysis of infected cells or recruitment of other important cellular mediators of protective immunity. However, the mechanisms regulating CD8+ T*Rm cell development are not completely understood. CD8+ T*Rm cell development involves several critical steps including T cell priming in draining lymphoid organs, the subsequent migration into non-lymphoid tissues, and in situ T*Rm cell differentiation and maintenance. It is generally thought that priming in specific lymphoid organs dictates the migration of effector CD8+ T cells to appropriate tissues, whereas factors existing in the tissue determine in situ T*Rm cell differentiation. However, whether priming in the draining lymphoid tissues also regulates intestinal T*Rm cell differentiation has not been addressed.

Methods: We established a mouse model to directly compare the impact of oral versus intravenous (i.v.) immunization on CD8+ T*Rm cell development. Mesenteric lymph nodes (MLN) and spleen are the primary sites of T cell priming after oral and i.v. immunization respectively, which allows us to study the role of priming in regulating intestinal CD8+ T*Rm cell development.

Results: We demonstrated that CD8+ T cells primed in the MLN differentiated into T*Rm cells efficiently after entering the intestine. In surprising contrast, CD8+ T cells primed in the spleen failed to differentiate into T*Rm cells after entering the same intestinal environment. We further demonstrated that pathogen-induced inflammation and pathogen-derived antigen in the intestine were dispensable for CD8+ T*Rm cell development of MLN-primed T cells. These data suggest that priming in the MLN is the major determinant of CD8+ T*Rm cell development in the intestine.

Conclusions/clinical relevance: CD8+ T*Rm cell development and thus the protective immunity in the intestine is greatly influenced by the route of immunization, which provides great implications on rational vaccine design for gastrointestinal infections and cancers.

Funding source: This work is supported by NIH/NIAID grant R01 AI076457.
A RARE CASE OF HYPODIPLOID PRECURSOR
B-CELL ACUTE LYMPHOBLASTIC LEUKEMIA

Authors: Dhanalakshmi Balakrishnan, M.D., Ann-Leslie Berger-Zaslav Ph.D., Yupo Ma MD PhD, Tahmeena Ahmed MBBS. Stony Brook University Medical Center, Department of Pathology, Stony Brook, New York, United States

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Submission Category: Post-doctoral Fellows/Fellows

Title Category: Case Report

Introduction: We present a rare case of near hypodiploidy in the setting of acute lymphoblastic leukemia. The patient is an 18 year-old male who presented with fever, headaches, night sweats, bone pain and malaise of one month duration. A complete blood count (CBC) showed leukocytosis, thrombocytopenia and increased blasts (13%). A bone marrow aspirate smear and biopsy showed complete replacement of marrow elements by small to medium sized blasts with large nuclei, open chromatin, prominent nucleoli and scant cytoplasm. Flow cytometry showed 93% blasts expressing CD19, CD34, CD38, TdT, DR, CD123, CD79a and CD10(calla).

Method/Results: Conventional G-banded cytogenetic analysis showed all cells had an abnormal chromosome number of between 27-28 chromosomes per cell with one X chromosome and one Y chromosome. These cells were near haploid. All chromosomes appeared to be structurally normal at a resolution of 400 chromosome bands. Fluorescence in situ hybridization (FISH) was performed with the CEP 4 (4p11-q11), LSI BCR/ABL DC DF (9q34.22q11.2), CEP 10 (10p11-q11.1), LSI MLL DC BAR (11q23), LSI ETV6/RUNX1(ES (12p13/21q22) (Abbott, Des Plaines, IL.) probes on 200 interphase nuclei per probe. The FISH results demonstrated a signal pattern consistent with one copy of the 4p11-q11(CEP 4) [89.5%] region of chromosome 4, the 9q34(ABL1,ASS) [89%] region of chromosome 9, the 10p11-q11.1(CEP 10) [81%] region of chromosome 10, the 11q23(KMT2A) [88.5%] region of chromosome 11, the 12p13(ETV6) [89.5%] region of chromosome 12, and the 22q11.2(BCR) [89%] region of chromosome 22. The FISH was also consistent with two copies of the 21q22(RUNX1) region of chromosome 21 in 89.5% of the nuclei and and four copies of 21q22(RUNX1) in 10.5% of the nuclei. The cells with four copies of 21q22(RUNX1) probably represent endoreduplicated haploid cells. These results confirmed the cytogenetic findings.

Conclusion: The near haploid karyotype seen in this patient has been reported in ~5% of ALL cases and is associated with a poor prognosis (Heim and Mitelman, 2015). These findings were consistent with a diagnosis of precursor B-cell Acute Lymphoblastic Leukemia, very high risk by age and hypodiploid status. The patient was started on induction chemotherapy. A bone marrow biopsy performed one month later showed morphologic remission. He is currently being evaluated for hematopoietic stem cell transplantation.
SELF-REPORTED HEALTH OUTCOMES OF VETERANS WITH PROSTATE CANCER: THE IMPACT OF POST-TRAUMATIC STRESS DISORDER

Authors: Lisa A. Bevilacqua, BS (MS3, Stony Brook SOM); A. Laurie W. Shroyer, PhD, MSHA (Stony Brook SOM, Department of Surgery); Jamie L Romeiser, MPH (Stony Brook SOM, Departments of Surgery and Anesthesiology); Elizabeth A. Vanner, PhD (Stony Brook SOM, Departments of Pathology and Bioinformatics); Nikita Agrawal, BA (MS4, Stony Brook SOM); Xiaoann Ni, BA (MS3, Stony Brook SOM); Jennifer A. Lyon, MS, MLIS, AHIP (Stony Brook SOM, Biomedical & Translational Research); Wen-Wei Tchou, MD (Northport VA Medical Center, Department of Hematology/Oncology)

Submission Category: Medical student

Introduction: The impact of PTSD on the health of Veterans with prostate cancer is unknown.

Methods: From September 2015 to October 2016, patients with prostate cancer at a Veterans Administration Hospital completed self-report surveys assessing their overall health status. Survey findings for patients with PTSD were compared to those without PTSD. Patients were considered PTSD+ if they had a diagnosis of PTSD in their Electronic Medical Record (EMR) or scored ≥ 50 on the PTSD Checklist—Civilian Version (PCL-C). Health outcomes included scores on the following self-report measures: VR-36 (Physical Component Score [PCS] and Mental Component Score [MCS]), Beck Depression Index (BDI), Beck Anxiety Index (BAI), and Pain Visual Analogue Scale (VAS).

Results: A total of 104 Veterans (18 PTSD+ and 86 PTSD-) completed all surveys. The average age was 74.6 ±7.8. 82.69% of patients were Caucasian. PTSD+ Veterans were significantly younger (69.4±7.4 vs. 75.7±7.5; p<0.001). No PTSD-related differences were found for race/ethnicity, BMI, or VR-36 PCS scores. PTSD+ patients had lower overall VR-36 MCS scores (36.9±12.8 vs. 52.7±10.5; p<0.001), and higher Pain VAS scores (3.9±2.6 vs. 2.1±2.2; p<0.01). PTSD+ patients were more likely to meet criteria for depression (61.1% vs. 8.1%; p<0.01) and anxiety (55.6% vs. 4.7%; p<0.01), and were more likely to have a history of suicidality (18.75% vs. 0.00%; p<0.01).

Conclusion: Compared to PTSD- Veterans with prostate cancer, PTSD+ patients were more likely to self-report increased symptoms of depression, anxiety, and pain as well as overall poorer mental health status as measured by VF-36 MCS. Further research is warranted to identify opportunities to improve mental health care for PTSD+ Veterans with prostate cancer.

Funding Source: Research Corporation of Long Island and Department of Medicine, Small Grants Program.

IRB Approval: Northport VAMC IRB Approval #00433
EVALUATION OF MECHANISMS PROMOTING ANTIBIOTIC RESISTANCE, TRANSFERENCE, AND PREVALENCE OF KLEBSIELLA PNEUMONIAE INFECTIONS

Authors: N. A. Mackow (natalie.mackow@stonybrookmedicine.edu; 631-338-4591)¹, M. Adnan (mutayyabaadnan@gmail.com)², K. I. Hanington (kaarina.hanington@gmail.com)², B. C. Fries (bettina.fries@stonybrookmedicine.edu )¹, E. Diago-Navarro (elizabet.DiagoNavarro@stonybrookmedicine.edu)¹;

Contact Information: ¹Department of Medicine, Stony Brook Univ. Sch. of Med., Stony Brook, NY; ²Stony Brook Univ., Stony Brook, NY

Submission Category: Medical Student

Introduction: Carbapenem resistant Klebsiella pneumoniae (CR-Kp) are emerging throughout the US and constitute a major threat as insufficient treatment options have lead to high mortality rates. In US strains, resistance to carbapenem is predominantly conferred by two genes, blaKPC-2 and blaKPC-3, which encode Carbapenem-hydrolyzing β-lactamases. The majority of clinical isolates of CR-Kp strains belong to the MLST-defined clone ST258, a globally spread clone associated with recent hospital outbreaks(1). Finally, little is known about the prevalence of Carbapenem sensitive (CS) ST258 strains and the predisposition of these to become CR. This project analyzed the presence of the CRISPR-Cas system in Kp hospital strains including those of the ST258 clonal background. This system has been found to suppress homologous gene transfer and prevent the integration of new genes by plasmids and bacteriophages. This study’s hypothesis is that the presence of CRISPR-Cas prevents the integration of CR plasmids in CS-Kp ST258 strains.

Methods: Kp strains from bodily fluids of patients from Montefiore Medical Center and Stony Brook University Hospital were collected and ST258 clonal background was determined. They were then analyzed for the presence of CRISPR-Cas. Published Kp strains were BLAST searched against published CRISPR sequences using CRISPRFinder. Next, CRISPR sequences in Kp strains were BLAST searched against all published Kp plasmid sequences. The CRISPR-containing Kp strains were determined to contain genes encoding Cas3, Cas1, and Cse1 and primers were designed to amplify them. 207 strains were analyzed for the presence of Cas genes (and by association, CRISPR) using PCR. Two-sided chi squared analysis was used to compare CRISPR-Cas content in CS versus CR strains.

Results: Out of 34 published Kp genome sequences, 7 were found to contain CRISPR-Cas. Of those, None. carried KPC plasmids. 20 of 27 CRISPR-free Kp strains contained antibiotic resistance plasmids with sequences matching the CRISPR spacer regions found in the 7 CRISPR-Cas-containing Kp strains, suggesting that CRISPR-containing strains were protected against the acquisition of these plasmids. Overall, Kp strains with CRISPR-Cas were significantly more likely to be CS (p=0.0378). Additionally, CS-Kp ST258 strains were significantly more likely (2/7) to contain CRISPR-Cas than CR-Kp ST258 strains (0/42).

Conclusions: This study supports the concept that the presence of CRISPR-Cas constitutes a mechanism in Kp strains that prevents acquisition of drug-resistance plasmids.

Funding Source: Scholarly Concentrations Program
BARRIERS TO PATIENT KNOWLEDGE AND UNDERSTANDING REGARDING A DIAGNOSIS OF CONGESTIVE HEART FAILURE

Authors: Shah, Rahul, MD, Parikh, Rushang, MD, Malaney, Roshini, DO, Cheung, Alice, MSII, Papdimitrou, Lampros, MD, Lense, Lloyd, MD

Submission Category: Fellow

Introduction: Congestive Heart Failure (CHF) is one of the most prevalent medical conditions encountered by health care providers. According to the CDC about 5.7 million adults in the United States have heart failure and about half of those die within 5 years of diagnosis. Treating this disease requires challenging lifestyle modifications as well as complex medication regimens, frequent testing and medical follow-up. The purpose of our survey is to examine the patient’s knowledge of their disease and identify potential barriers to their health maintenance in order to improve patient morbidity, mortality and quality of life as well as decrease health care costs.

Method: A 15 question survey was created to address key elements of heart failure with each patient. The survey included yes or no and multiple-choice questions to gauge the patient’s knowledge of their ejection fraction, signs and symptoms, dietary restrictions and indication for medications. The surveys were distributed in the cardiac units at Stony Brook University Hospital as well as outpatient cardiology and primary care clinics to patients that were diagnosed with either heart failure with preserved or reduced ejection fraction. Data was collected from the encounter in hospital and in clinics to compare differences in knowledge base in the context of level of education and primary language. Barriers to patient care such as disease burden, diet, appointment frequency, communication with health care providers, disease related costs were also analyzed. The data was placed into a spreadsheet and analyzed using statistical software.

Results: No correlation between level of education and knowledge of their diagnosis of CHF in the selected patient population. Patients who understood the concept of ejection fraction and knew their own were more likely adhere to diet and lifestyle changes and take recommended medications. More than 40% of patients stated that lack of knowledge was an obstacle to maintaining their disease. Due to limited power, primary language was unable to be analyzed as an obstacle in patient understanding.

Conclusion/Clinical Relevance: CHF continues to rise in prevalence and is an extraordinary disease burden on patients as well as the health care system. While patients with CHF require careful medical attention from a health care provider, it is important for them have an understanding of the disease in order to effectively participate in the lifestyle modifications and medication adherence needed to control it.
SCALP/SCHIMMELPENNING SYNDROME (SNS)
PRESENTING WITH ANEURYSMS AND
NEONATAL STATUS EPILEPTICUS

Authors: Elizabeth Ng MD\(^{1,2,3}\), Mary Andriola MD\(^{1,2,4}\), Rebecca Spiegel MD\(^{1,2,5}\), Louis Manganas MD PhD\(^{1,2,6}\)

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Category: Fellow

Introduction: SCALP Syndrome is a rare sebaceous nevus syndrome involving CNS malformations, aplasia cutis congenital, limbal dermoid and pigmented nevus. SNS is included in this sebaceous nevus syndrome and characterized by craniofacial sebaceous nevus, skeletal and ocular abnormalities, and cerebral defects resulting in intellectual disability and seizures. Somatic mutations of HRAS and KRAS have been reported in these patients, which may predispose them to adnexal skin tumors and seizures. Treatment is symptomatic and multidisciplinary. The skin lesion should be monitored regularly and biopsy or excision performed for suspicious changes.

Methods: We describe the presentation and management of a newborn girl with SCALP/SNS, partial status epilepticus and aneurysms not previously reported. Literature review was performed on this rare condition to compare clinical presentation, neuroradiological findings and management.

Results: Patient presented on day of life 10 with partial status epilepticus. Video EEG showed nearly continuous seizures over left temporal region with rapid spread to left central region with clinical desaturation noted. Patient was loaded with phenobarbital with eventual control of seizures. MRA of Head showed fusiform aneurysms of the left carotid terminus and left posterior cerebral artery. MRI of Brain showed nonspecific enhancing skin lesions over the left parietal scalp and left periorbital region, left middle cranial fossa arachnoid cysts, mega cisterna magna, and left hemispheric atrophy. CT of the Head showed calcification of the left globe of sclera and osteosis of the left temporal bone. The patient had incomplete closure of the left canthus, epibulbar dermoid, prominent left zygomatic arch with overlying soft tissue mass, multiple left upper eyelid skin tags (nodules, cystic lesions), and multiple regions of left scalp aplasia cutis. The patient is now 2 months old and maintained on phenobarbital and keppra. Review of literature was performed on this rare condition to compare clinical presentation, neuroradiological findings and management.

Conclusions: SCALP/SNS are a rare neurocutaneous diseases characterized by the classic triad of sebaceous nevi, seizures and intellectual disability. It is listed in the US-registry of the National Organization for Rare disorder. These aneurysms in this patient have not been reported in prior case studies. An accurate diagnosis is paramount because the great risk for multi-organ involvement and follow-up is essential because of increased risk for CNS melanoma, symptomatic neurocutaneous melanosis, neurodevelopmental delays and seizures.
Authors: Melissa Mortensen MD

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Submission Category: Faculty

Objectives: To report a small case series of an unusual ingested foreign body and how to remove them in a minimally invasive way. Their small size can enable them to become incorporated into local tissues. This can present a challenge for endoscopic removal. We present a case series of trans-nasal endoscopic removal and literature review highlighting the challenges of their management.

Methods: Six patients were identified with wire bristle foreign bodies between 2011 and 2016 at our academic tertiary medical center. Their medical records were reviewed and are described in this report.

Results: Three of six patients had the bristle in the lingual tonsils. In one other patient it was between the lingual tonsils and the pharyngoepiglottic fold. In two of these cases the foreign body was removed with the transnasal laryngoscope with working channel and biopsy forceps under local anesthesia. Two patients underwent direct laryngoscopy with foreign body removal, but one of those patients did require intra-operative fluoroscopy. In 1 patient the wire went from the esophagus into the deep spaces of the neck, removed by an open procedure. In one other patient it presented as a complicated deep space neck infection.

Conclusions: Wire brush bristles can easily become displaced while cleaning and subsequently become lodged in the upper or lower aerodigestive tract. Sometimes localization of the foreign body is difficult. Radiography can be performed but CT examination is superior for precise localization and in preparation for an operative approach. Contrast should be used if migration of the foreign body is suspected. Due to the potential of serious complications from ingestion of bristles, wire brushes should be used carefully while cleaning barbeque grills, and grilled foods should be inspected for bristles prior to consumption.
DEVELOPMENT OF A SIMULATED PATIENT SAFETY PROGRAM TO INCREASE INTERPROFESSIONAL COMMUNICATION

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Category: Faculty

Introduction: Ineffective healthcare teamwork skills and communication are associated with medical errors and poor outcomes. There is an increased emphasis on patient safety and interprofessional (IP) team training. Simulation can be used as a training method to reduce errors and improve safety. The purpose of this study was to develop and evaluate a simulated patient safety program that can be used to increase IP communication in pre-licensure and post licensure health care professionals.

Methods: To date, 81 medical and nursing students participated in a 2.5 hour simulation session. Participants were divided into IP teams of 4-5 participants. Each team participated in one 10 minute hybrid simulation and observed 2 simulations while evaluating the other team’s performance. Each simulation is followed by a facilitator lead 20 minute debrief. Three instruments are administered both pre-training and post-training to examine patient safety knowledge, attitudes, teamwork and communication skills. To assess attitudes toward team communication, the TeamSTEPPS Teamwork Attitudes Questionnaire (TAQ) developed by the Agency for Healthcare Research and Quality (AHRQ) was administered. The second instrument was developed by the University of Washington’s Center for Health Science Interprofessional Education, Research and Practice and is the Attitudes, Motivation, Utility and Self-Efficacy (AMUSE) tool used to assess AMUSE toward IP team skills (Brock et al., 2013). Knowledge of patient safety/team communication skills was measured using a 10 question multiple choice pre/posttest developed by an interdisciplinary team of patient safety experts.

Results: Complete data has been collected on 79 participants. Preliminary results of the knowledge pre/posttest revealed there was a statistically significant increase in the knowledge of patient safety/team communication from the pretest (M=7.18, SD=1.65) and the posttest (M=8.14, SD=1.47) at p=.000. Greatest improvements in knowledge were noted in understanding TeamSTEPPS and team communication tools such as call outs, huddle, and “CUS” (all at p <0.05). Next steps include completion of data analysis on attitudes, teamwork, and communication skills.

Conclusions: Preliminary findings suggest a simulated patient safety program can be used to increase knowledge regarding IP communication.

IRB (CORIHS) approval: 834847-3 on 06/16/16
FACTORS CONTRIBUTING TO APPROPRIATE SHARPS DISPOSAL IN THE COMMUNITY AMONG PATIENTS WITH DIABETES

Authors: Huang L1, Katsnelson S2, Yang J3, Charalambos A4, Charitou MM5

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Submission Category: Resident

Background: Each year, more than 2 billion needles and syringes are used by self-injectors, largely for the treatment of diabetes. Proper disposal of sharps (e.g. syringes, needles, lancets, etc.) in hospital settings has been well-studied, but sharps disposal habits in the home setting are often not addressed, resulting in erratic use of proper disposal of sharps and thus, increased risk of needle-stick injuries and infections. Our study aims to evaluate methods of disposal and patient demographic factors associated with correct disposal of diabetes-related sharps in the community.

Methods: This study was conducted at an endocrinology clinic at an academic tertiary care center. A 21-question survey was administered to 160 patients with the diagnosis of diabetes mellitus excluding patients who reside at long-term care facilities. 9 patients were removed from the study due to an incomplete survey. Correct disposal of sharps was defined as use of a designated sharps or other leak proof container in the home setting. Numerous patient factors were evaluated for a clinically significant association to correct disposal of sharps via chi-square testing.

Results: Of the 151 patients who completed the survey, 59% disposed of their sharps correctly. Those with diabetes for more than 30 years had the lowest rate of correct disposal (36%) when compared to those with less than 30 years (66%, p = 0.0321). Age, gender, education level, type of diabetes and type of diabetes regimen were not associated with correct disposal.

Upon controlling for education level and marital status, patients who received formal training on proper sharps disposal from a nurse (OR 3.95, 95% CI: 1.37-11.34) or from other sources (OR 4.55, 95% CI 1.5-13.85) were more likely to dispose sharps correctly than patients who have never received training. Controlled for education level and resource of training, married patients were less likely to correctly dispose sharps than unmarried patients (OR: 0.36, 95% CI: 0.14-0.92, p = 0.033).

Conclusions/Clinical Relevance: This study was the first to examine disposal practices and the possible associated risk factors to poor disposal methods in a tertiary medical center in the United States. It showed that a large portion of our patients with diabetes have improper sharps disposal practices. Prior formal training in disposal was associated with higher rates of correct practices, suggesting that increased emphasis on provider-patient education can lead to significant improvement in proper disposal habits. Further emphasis on education should be considered in patients who are more at risk for incorrect disposal.

CORIHS#: 2014-2897-F
TOE-WALKING IN A TODDLER-
HOW SERIOUS CAN IT BE?

Authors: Linda-Marie Ustaris, DO, Resident Physician; Ratna Basak, MD, Faculty; Jonathan Tolentino, Faculty

Submission Category: Resident

Background: Idiopathic toe walking is a common finding in toddlers. However, a broad differentials are required to be considered to ensure that toe walking is not the initial presentation for a more severe neurologic disease.

Case: A four-year old girl presents with toe-walking and new onset right leg pain, unsteady gait and frequent falls worsening over 2 months. Initial evaluation revealed normal strength and reflexes, tight Achilles’ tendons with Babinski sign bilaterally, normal serum creatinine phosphokinase and unremarkable MRI of brain and lumbar spine. At two-week follow-up, she was unable to stand, with decreased asymmetric strength in her lower limbs, right greater than left. She had sustained ankle clonus and +3/4 right patellar reflex. EMG showed normal nerve conduction but reduced motor unit potential activation. MRI of cervical and thoracic spine found a large intradural and extradural mass arising from the right C7 nerve root with evidence of cord compression and extension into the right brachial plexus. She underwent a C6-C7 laminectomy with excision of tumor. Pathology revealed spindle cell tumor with S-100 staining consistent with schwannoma. After surgery and a few weeks of physical therapy, she was able to walk flat-footed.

Conclusion: Toe-walkers are characterized by neurologic impairment, congenital short Achille’s tendon, habitual toes walkers or unclassified. The prevalence of idiopathic toe walking is between 2-12% in children, with a family predisposition in 30-42% of cases. Idiopathic toe-walking is a diagnosis of exclusion when it persists after 3 years old.

There is no reported case of toe-walking in an individual with a schwannoma. The most alarming features of this patient’s presentation were her upper motor neuron signs suggestive of a long tract myelopathy. These are common findings in intradural-extramedullary tumors, but an atypical presentation of schwannomas. Unilateral hearing loss, dizziness or tinnitus is the more recognizable feature because vestibular schwannomas are the most common location. It is possible that toe-walking in this child was an early sign of neurologic deficits caused by the schwannoma. It emphasizes the importance of a thorough work-up for toe-walkers.

Our patient’s age at diagnosis is premature for the typical demographics of patients with Schwannomas who usually present in their third decade of life. She is one of the youngest presentations of a schwannoma. Early age presentation of schwannomas may suggest a possible genetic syndrome. Genetic testing and close monitoring for recurrence is prudent.
ENHANCED BIOMARKER PERFORMANCE IN MAJOR DEPRESSIVE DISORDER WITH A NOVEL IMAGE RECONSTRUCTION APPROACH

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Objectives: MDD is a chronic recurrent illness and second leading cause of global disease [1]. Measuring the serotonin 1A receptor density with [11C]WAY-100635 PET within the raphe, the principle site of serotonin release in the brain, may be an objective biomarker for MDD. Obtaining an accurate signal from the raphe is difficult due to its small size and subsequent partial volume error. This study evaluated the utility of a previously developed PET reconstruction approach, Gradual Point Spread Function-MLEM (GPSF-MLEM) [2], shown to improve signal recovery in the raphe [3].

Methods: Imaging data were obtained for 35 male subjects (20 healthy controls, 15 MDD) from a previous study [4]. [11C]WAY-100635 ECAT HR+ PET scans (120 minutes) were reconstructed with Filtered Back Projection (FBP) and GPSF-MLEM using Software for Tomographic Image Reconstruction (STIR) [5], motion corrected, and coregistered with the MRI. One control subject deemed an outlier was excluded. Raphe (derived from a PET atlas) [6] time-activity curves were extracted and BPF quantified using a two-tissue compartment constrained model with cerebellar white matter as a reference with one-tissue compartment fit; metabolite corrected arterial input function. The performance of classifying diagnosis was assessed with GPSF-MLEM and FBP.

Results: Receiver operating characteristic area (ROC) area under the curve was 0.98 for GPSF-MLEM and 0.92 for FBP. The sensitivity/specificity/accuracy at a balanced and high specificity BPF cutoff were 93/89/91 and 87/100/94 for GPSF-MLEM, and 87/79/82 and 53/100/79 for FBP.

Conclusion: Measuring raphe signal from GPSF-MLEM reconstructed PET images improves the accuracy of diagnostic classification as compared to FBP reconstruction; aiding the development of a MDD biomarker by potentially allowing for earlier identification of failed treatment and early intervention.

Funding Sources: This work is partially supported by NIMH grants MH40695, MH62185, R01 MH074813-01 and grants through The Stanley Medical Research Institute and American Foundation for Suicide Prevention funded by the Columbia University grants office.

Human Subjects: The IRB numbers for the study are 4979R, 3924R, 5079R, 3752, 5101R, 4086, 5771R and 6351R. The IRB approvals were made by Columbia University and New York State Psychiatric Institute.

LOW INCOME SUBURBAN RESIDENTS PERCEIVE A GREATER LACK OF SPECIALISTS BUT NOT PRIMARY CARE PHYSICIANS THAN THOSE WITH HIGHER INCOMES

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Submission Category: Graduate Student

Introduction: The increasing number of low income residents in the suburbs of major metropolitan regions may be posing new challenges in health delivery for some areas. We compared residents’ perceptions of access to primary care (PCP) and specialty (SCP) physicians in two neighboring counties of Long Island New York, which differ in physician density and health care delivery models for low income suburban communities.

Methods: 812 residents of Nassau (NC, 6.9 physicians/1,000) and Suffolk (SC, 3.5 physicians/1,000) counties were contacted by telephone asking whether there were “too few,” “about the right number” or “too many” PCPs and SCPs. Counties were compared by bivariate analyses, and multivariate logistic regression examined the association of residents’ perceptions of PCP and SCP access with demographic variables, including income category.

Results: Twice as many SC respondents perceived too few SCPs compared to NC (35.31% v. 18.27%, p<.001) and 50% more perceived too few PCPs (32.56% v. 23.85%, p=.06). For both counties, those with incomes less than $35,000/per year were twice as likely to perceive too few SCP while in SC, the low income group was three times as likely to perceive too few SCPs. There were no significant associations between income and perception of PCP availability.

Conclusions: The strongest perception of too few physicians was for specialists among low income residents, especially in SC, which, unlike NC, has no county-supported specialty care. Given the continuously increasing influx of low income people to the suburbs of metropolitan regions, public health planning should recognize the unmet need for specialty care as well as primary care. In addition, although both counties have more physicians than the national average (2.9 physicians/1000), differences between them in unmet demand for both PCP and SCP reflected differences in availability, suggesting that, for certain areas, the national average is not sufficient to fully meet perceived demand.

Funding source(s): Internal
BREAKING FREE AND REGAINING CONTROL: A MODEL OF DANCE/MOVEMENT THERAPY (DMT) FOR RESILIENCE-BUILDING IN PEOPLE LIVING WITH CHRONIC PAIN

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**Title category:** Postdoctoral fellow

**Introduction:** Chronic pain is a complex phenomenon, profoundly affecting the quality of life and the entire personhood of the afflicted individuals. Dance/movement therapy (DMT) is a potentially effective approach that can address the multidimensional impact of chronic pain; however there is a lack of research and little is known about the mechanisms of DMT for chronic pain management.

**Methods:** This study aimed to (a) examine the effect of DMT on pain and psychological outcomes - mood, stress, relaxation, body awareness, kinesiophobia, and resilience, and (b) develop a theoretical model that explains the mechanisms of DMT for resilience-building in people with chronic pain. A three-phase Mixed Methods Grounded Theory study was conducted, during which a preliminary model was generated based on two sets of data collection and analysis processes (i.e., meta-modeling and grounded theory), tested through a clinical experiment (i.e., a 10-week group DMT intervention), and then refined and integrated to construct a final composite model.

A total of 35 people living with chronic pain (M =54.1, Female= 89%) participated in the study. The results shows that there was a statistically significant improvements in resilience (p < .001), kinesiophobia (p =. 03), body awareness (p = .02), and pain intensity (p = .03) over time. 68% of people felt moderately to a great deal better after the intervention. We also found significant within session changes for mood, stress, relaxation, and pain (p < .001). Key mechanisms - activating self-agency, connecting to self, connecting to others, enhancing emotional intelligence, and reframing – as well as intervening conditions and contextual conditions were identified. Based on these findings, a theoretical model explicating the mechanisms of DMT for resilience-building in people with chronic pain was constructed.

**Results:** DMT is a promising treatment that supports positive coping and adjustment in people living with chronic pain through activating unique mind and body pathways.

**Funding source:** Marian Chace Foundation
SR-18662: A POTENT COLORECTAL CANCER GROWTH INHIBITOR

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Submission Category: Post-doctoral Fellow

Introduction: Krüppel-like factor 5 (KLF5) is a member of the SP/KLF family of zinc finger transcription factors and is highly expressed in the proliferative regions of the intestinal epithelium. KLF5 is upregulated in human colorectal cancer specimens and is also associated with cancer progression. In addition, haploinsufficiency of KLF5 in mice harboring a germline mutation in Apc, a colon cancer suppressor gene, significantly reduces intestinal tumor formation. These findings suggest that an inhibitor of KLF5 expression would be useful as a therapeutic agent to suppress intestinal tumor progression. In a collaborative effort with The Scripps Research Institute, we developed ML264, which restricts colorectal cancer (CRC) growth by inhibiting cell cycle progression as well as the expression of EGR-1. In ongoing optimization efforts we have identified a fourth generation analogue, SR-18662, that demonstrates superior efficacy. We aim to investigate the mechanism whereby SR-18662 inhibits CRC proliferation and to evaluate its efficacy in vivo.

Methods: In vitro: All experiments were done in DLD-1 and HCT116 human CRC cell lines. We analyzed cell viability using the Cell-Titer Glo system, performed cell cycle and cell death analysis using flow cytometry, and investigated protein levels of various components of the EGFR and WNT signaling pathways as well as cyclins using western blotting techniques. Cells were treated with DMSO (control), ML264, SR-15006 (a 3rd-generation analogue), and SR-18662 at 24, 48, and 72 hours. In vivo: We subcutaneously injected DLD-1 cells into athymic mice and monitored tumor growth. Then we intraperitoneally injected 5mg/kg or 10 mg/kg of SR-18662 vs. vehicle control for ten days once or twice daily, with a two-day mid-treatment break.

Results: In vitro: The cell viability assay found that SR-18662 inhibited cellular proliferation more effectively than did ML264 within 72 hours. Unlike ML264, SR-18662 can initiate cellular death. Flow cytometry analysis showed an increase in cells attenuated in S phase as well as a significant increase in apoptosis after SR-18662 treatment. Western blot analysis showed a decrease in EGR-1, KLF5, β-catenin, cyclin E, cyclin D1, as well as an increase in cleaved caspase 3. In vivo: We observed a significant dose-dependent decrease in xenograft growth at a lower dose of SR-18662 than was used for a previous ML264 study.

Conclusion: In vitro and in vivo, SR-18662 strongly inhibits the growth of colorectal cancer cells, moreso than did ML264, and has the potential to be an effective drug for colorectal cancer therapy.

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CONTINUOUS COCAINE ADMINISTRATION
RESULTS IN SIGNIFICANT TRABECULAR BONE DETERIORATION

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Introduction: Cocaine is a dangerous drug where extreme usage may lead to death from heart attack, stroke, cerebral hemorrhage or respiratory failure (1). While research conducted on the long-term effects of cocaine has found dangers such as severe damage to the heart, liver and kidneys, not much is known on the effects to the skeletal system. Therefore, using a rat model, this study aims to determine the effect of cocaine on the trabecular bone located in the proximal metaphysis of the tibia, during continuous cocaine usage.

Methods: This study compared trabecular bone in the tibia of 18 Sprague Dawley rats (ten weeks old); which received treatment for two weeks and four weeks (control n=3, cocaine n=6). The rats were treated with cocaine (35mg/kg/day) in the experimental group and 0.9% saline (0.7cc/100g/day) in the control. After fixation the bones underwent micro CT scanning for structural analysis. The tibia was analyzed for differences in bone mineral density (BMD), bone volume fraction (BVF), bone volume (BV), and trabecular separation (Tb.Sp).

Result: When comparing the trabecular bone in the proximal metaphysis of rats treated with cocaine for two weeks to those for four weeks, it is evident that the extended exposure to cocaine significantly decreased BMD, BVF, and BV (p<0.05). However, trabecular bones in the control group showed no significant difference. (p>0.05). Furthermore, there was a significant increase of Tb.Sp in the cocaine-administered group (+74.0%, p<0.05) and an insignificant increase of Tb.Sp in the control group (+0.4%, p>0.05). This data indicates that 4-week cocaine exposure has a severe negative effect on bone quality over time and the trabecular bone becomes severely spaced out.
**Conclusions:** Continuous cocaine usage has been found to cause a significant reduction in the material and structural properties of the trabecular bone in the tibia, as well as increase the trabecular separation, which could lead to bone quality deterioration. This suggests that cocaine exposure has a negative effect on bone quality and growth over time. Through this study, we gain a greater understanding of the damaging effects of cocaine on the skeletal system. Further analysis into the histology, mechanical properties and bone remodeling biomarkers of the bones would aid in understanding the underlying mechanism of these damages.

**Acknowledgements:** The NIDA drug supply program for providing the cocaine utilized in this study.

**References:** 1) "A Deadly White Powder" *Drug Free World. Foundation for a Drug-Free World*, 2016.
ULTRASOUND AS A NONINVASIVE TOOL TO DIAGNOSE TRAPPED LUNG

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Introduction: Pleural effusion is a common reason for pulmonary consultation, however not all patients benefit from pleural drainage. Trapped lung is an important example of such a condition. The current means of identifying trapped lung is intra-procedurally using pleural manometry or post-pleural drainage when the patient is noted to have a non-expanding lung and complications such as broncho-pleural fistula. Sinusoid Sign is a bedside ultrasound (US) finding that demonstrates the presence of lung motion during respiration within pleural fluid. Being that trapped lung does not expand within pleural fluid or after its drainage, we hypothesized that US can be utilized to diagnose trapped lung prior to intervention. We have shown an important predictive and management role for bedside US.

Methods: Patients included were those scheduled for a thoracentesis. We performed pre-procedure US to assess for Sinusoid Sign. To diagnose trapped lung, pleural pressures were recorded using a digital manometer during thoracentesis at pre-determined intervals of volume until the procedure was complete.

Results: This case series demonstrated that the pleural pressure pattern diagnostic of trapped lung was associated with Absent Sinusoid Sign. In contrast, minimum pressure changes, which is indicative of a mobile and expanding lung was associated with Present Sinusoid Sign. Finally, lung entrapment, where the lung is partly expandable, was associated with Blunted Sinusoid Sign.

Conclusions: The use of US to identify trapped lung is important because, to date, a reliable prospective method to predict trapped lung does not exist. A pre-procedure diagnosis of trapped lung using US will reduce unnecessary bedside pleural procedures and related complications.

CORIHS approval date & number: CORIHS# 2015-2999-R1, active/open for enrollment (expiration date 1/10/2018)
IMPROVING ADHERENCE TO CARE RECOMMENDATIONS USING A COMMUNITY HEALTH WORKER (CHW) INTERVENTION WITH THE PEDIATRIC MEDICAL HOME

Authors: Sarah P Justvig, BS¹, Justine Li, BS², Giuseppina Caravella, MPH³, Minqin Chen, MS⁴, Hua Wang, MS³, Lisa A Benz Scott, PhD⁵, and Susmita Pati, MD MPH³.

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Submission Category: Medical Student

Introduction: While CHW interventions improve health outcomes, evidence identifying specific domains of CHW-delivered support resulting in positive outcomes is limited. Aims were to identify domains of CHW-delivered support that assist families with adhering to recommended pediatric care; and, to identify predictors of successful completion of an enriched medical home intervention (EMHI) using trained CHWs making home visits to provide health education and support positive health behaviors.

Methods: Prospective descriptive study of 88 families participating in a protocol-based EMHI. Completers (N=46) finished the program with mutual agreement that the family can independently adhere to recommended clinical care. Non-completers (N=42) were lost to follow-up or dropped out of the program before reaching this milestone. Using Grounded Theory, two trained coders evaluated CHW tasks recorded in an electronic database and classified these tasks across 17 domains. We assessed predictors of EMHI completion using logistic regression.

Results: The 88 EMHI participants were primarily <24 months of age (80%), Hispanic (66%), and Medicaid enrollees (67%). Hispanic families (OR=2.76, p=0.04) and those with self-reported program goals to ‘facilitate family’s creation of a system to keep track of child’s medical information’ (OR=3.11, p=0.02) or a ‘newborn-specific goal’ (OR=3.21, p=0.04), such as feeding and safety tips, were more likely to complete the EMHI compared to their counterparts. The most consistent CHW tasks were supporting medical appointments, medication maintenance, and providing health education.

Conclusions: CHW interventions designed to improve health behavior outcomes of ‘at-risk’ families, including Medicaid enrollees, may benefit from support in goal-setting and strategies to systematically manage their child’s medical care.

Funding Source: New York State Department of Health

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ANTIBIOTIC STEWARDSHIP IN NEONATAL INTENSIVE
(ASPIN) OPTIMIZES ANTIBIOTIC USE AND
MINIMIZES PRACTICE VARIATION IN LEVEL III NICU

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Submission Category: Fellow

Introduction: Antibiotic Stewardship optimizes antibiotic use and reduces comorbidities in the NICU. There are huge practice variations amongst caregivers in academic settings regarding the choice and duration of antibiotic treatment in infants with culture negative sepsis. Published Centers for Disease Control (2010) and Fetus and Newborn Committee (2014) guidelines lack evidence on the duration of antibiotic therapy for early onset sepsis or culture negative sepsis, thus its use is often left at the discretion of the caregiver.

Objective: Smart Aim: Decrease antibiotic use by 10% in 2016
Decrease average days of treatment for clinical sepsis (culture negative sepsis) by 20% by June 2016

Design/Methods: ASPIN team was convened in November 2014 to minimize existing practice variations and improve prescribing attributes among caregivers, thereby reducing some comorbidities (i.e. Necrotizing Enterocolitis and Acute Kidney Injury) related to antibiotic use in our NICU.

The reducing complications team in the NICU established daily goals and instituted daily multidisciplinary rounds to enhance communication among team members. Bundles and prescribing guidelines were established with input from Pediatric Infectious Disease specialist, Pediatric Nephrologist, the medical teams, pharmacy, nursing and hospital quality improvement staff.

Team had monthly meetings and established PDSA cycles to meet the unit needs in improving our study measures. Data collection is ongoing and they were disseminated to NICU teams at monthly meetings with feedback incorporated into future PDSA cycles.

Results:
- Antibiotic usage rate (AUR) of 0.5/1000 days in 2015 during first post intervention period, which deline by 17% to 0.43/1000 patient days in 2016
- The most commonly prescribed antibiotics pre-intervention period in order: Ampicillin\Gentamicin\Cephalosporin\Vancomycin\Flagyl\Meropenem\Zosyn
- The most commonly prescribed antibiotics post- intervention: Ampicillin\ Gentamicin\ Vancomycin\ Cephalosporin\ Flagyl\Zosyn
- Zosyn became our preferred antibiotic for NEC stage 2B and usage increased accordingly
- Meropenem use fell to zero in 2016
- The duration of antibiotic use for culture negative sepsis was significantly reduced by 28%(from a 7 day to a 5 day course), with more treated for just 2 days.

Conclusion: We conclude that instituting daily multidisciplinary rounds and establishing daily goals improves antibiotic use in a tertiary care NICU. In addition, developing Sepsis Guidelines and Treatment protocol targeting disease specific conditions minimizes variation with both choice and duration of antibiotic therapy.
ADHESIVE CAPSULITIS: ASSOCIATION OF MRI FINDINGS AND THE CLINICAL ORTHOPEDIC EXAM

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Submission Category: Fellow

Introduction: Adhesive capsulitis (AC) is generally a clinical diagnosis, based on history and clinical examination. MRI is often performed to exclude alternate etiologies of the patient’s symptoms. While MRI of AC has received attention in the literature recently, there are scant studies associating MRI findings with clinical exam scores. The purpose of our study is to investigate this association.

Methods: With IRB approval, this study included 256 subjects with symptoms of untreated, unilateral idiopathic AC for 3 months but no more than 12 months. Clinical evaluation included calculation of the American Shoulder and Elbow Surgeons Shoulder (ASES) function and pain scores as well as shoulder range of motion (ROM) under physician guidance. Both active and passive ROM evaluation included forward flexion, abduction, external rotation, and internal rotation. Each patient received non-contrast MRI of the affected shoulder within 30 days of clinical assessment.

Two musculoskeletal radiologists blinded to the MRI reports interpreted the study for various MRI characteristics of AC. For this study, the most prevalent findings were graded using a 3-point Likert scale (normal, mild, and moderate/severe). These included coracohumeral ligament thickening, capsular thickening at the axillary pouch, edema within the axillary pouch region, and synovitis along the superior border of the subscapularis tendon/subcoracoid fat. Overall assessment of AC severity was also graded.

One-way Analysis-of-Variance models were used to associate the clinical findings with MRI characteristics. Analysis was performed using SAS 9.3 (SAS Institute Inc., Cary, NC) and significance level set at 0.05.

Results: Multidirectional ROM and clinical exam scores were grouped, thus, our p-values are reported as a range. All MRI findings showed some significant correlation. Edema within axillary pouch was associated with clinical exam scores (p 0.004-0.035), active ROM (p <0.001-0.021), and passive ROM (p <0.001-0.007). Overall assessment of AC severity was associated with the clinical exam scores (p <0.001-0.005), active ROM (p <0.001-0.041), and passive ROM (p <0.001-0.028). These two findings demonstrated most significant association.

Conclusions/clinical relevance: There is strong association between specific MRI characteristics and symptoms in patients with clinically confirmed diagnosis of AC, thus suggesting that MRI can serve as a tool for grading severity and guiding clinical treatment. Further investigation is needed to determine efficacy of MRI post treatment and whether clinical stage of AC correlates well with MR findings.

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NADPH OXIDASE IS A CENTRAL MEDIATOR OF HIGH-FAT DIET AND MUTANT KRAS INDUCED PANCREATIC CANCER

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Submission Category: Assistant Professor (Tenure Track)-Faculty

Introduction: Pancreatic cancer is projected to become the second leading cause of cancer-related death by 2030. The genetic landscape of pancreatic ductal adenocarcinoma (PDAC) shows nearly ubiquitous mutations of Kras. However, expression of mutant Kras alone is insufficient to drive PDAC, suggesting a second hit is required. Obesity is a modifiable risk factor for PDAC and high-fat diet (HFD) consumption is a major component that drives obesity. Recent studies in genetically engineered mouse models have demonstrated that consumption of a HFD can synergize with mutant Kras to induce a long-sustained inflammation and PDAC with high penetrance. Inflammation generates large amounts of reactive oxygen species primarily from NADPH oxidases (NOX). This study is to test if NOX is a central mediator of HFD and an endogenous level of Krasmt induced PDAC.

Methods: We knocked out the NOX docking subunit p22phox to abrogates NOX enzyme activity specifically in adult pancreatic acinar cells in mice harboring endogenous KrasG12D/+ to generate a mouse model expressing KrasG12D/+;p22phox-/- and exposed the mice to a high-fat diet for 10 weeks or until aging. We compared the mice harboring KrasG12D/+;p22phox-/- with the mice expressing only Kras12D/+ in terms of pancreatic acinar cell damage, stellate cell activation, immune cell infiltration, pancreatic inflammation, PDAC, and survival under HFD using standard methods. KrasG12D/+;p22phox-/- mice or KrasG12D/+ mice fed a normal diet were used as controls. The wild-type Kras expressing mice fed either a normal diet or a HFD were also used as controls.

Results: p22phox knockout in KrasG12D/+ mice preserved pancreatic acinar cells from KrasG12D/+ mediated damage, inhibited stellate cell activation, prevented inflammation and immune cell infiltration. In addition, histological analysis using H&E staining demonstrated that p22phox knockout in KrasG12D/+ mice considerably inhibited PDAC formation (0/15 PDAC in KrasG12D/+;p22phox-/- mice vs 9/15 PDAC in KrasG12D/+ mice after feeding a HFD for 10 weeks ) and significantly prolonged the survival (the median survival time of KrasG12D/+;p22phox-/- mice compared with KrasG12D/+ mice was >440 days vs. 220 days (p<0.0001, log rank test).

Conclusions/clinical relevance: NOX is a critical mediator of HFD and KrasG12D/+ induced inflammation and PDAC. Knocking out p22phox, a docking subunit required for NOX activities, considerably inhibited the synergistic effect of HFD and mutant Kras-mediated a long-sustained inflammation and PDAC formation. This research has filled an outstanding knowledge gap in the pancreatic cancer field and will provide valuable pancreatic cancer prevention and therapeutic strategies in humans.

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IMPLEMENTATION OF A WEB-BASED PATHOGEN SPECIFIC SURVEILLANCE SYSTEM (iPASS) FOR RESPIRATORY PATHOGENS

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Category: Faculty

Introduction: Real-time monitoring of respiratory pathogens, RP, across the United States benefits public health. Tracking RP requires comprehensive diagnostic testing and automated collection, analysis and distribution of this data. Comprehensive RP testing can be performed with the FilmArray Respiratory Pathogen panel and the BioFire's FilmArray® (FA) platform. The panel simultaneously detects 20 viruses and bacteria. However RP tracking has not been fully addressed. There is no general mechanism for exporting test results and integrating the information across time and space. Existing infectious disease surveillance systems such as the ones from CDC and NYS Dept. of Health are limited to a small number of pathogens, are slow, complex to implement and geographically localized. We present the results of the development and implementation of the iPaSS system: FA-Trend to monitor RP infections.

Methods: All RP test results obtained with the FilmArray Respiratory Pathogen panel were uploaded on real time onto a secure, HIPAA-compliant, database. The aggregated data was plotted and analyzed. Periodic review of the data was performed. The information can be viewed in the https://trends.filmarray.com/ site.

Results: FA Trend software was installed on a total of 55 FA instruments at 14 participating US labs, 6 at Stony Brook Hospital. Throughout 2016 around 70,000 runs were uploaded to the database. The trends FilmArray website displayed the daily fluctuation of 20 pathogens detected in the laboratories participating in this project. Starting in April 2016, Rhinovirus and Enterovirus were the most prevalent viruses throughout the country, this trend changed in the middle of November when RSV became the most common one. Since December 15, 2016 there has been an increase in the number of infections caused by Influenza A and coronavirus OC43. Only influenza A subtype H3 is being reported this 2016-2017 flu season.

Conclusion: FA Trend is a useful tool to analyze and monitor respiratory virus trends in the country by seasonality of organisms. It allows the comparison of the onset and duration of specific pathogens making up the respiratory season at different sites in the country. This information is also useful for other areas of the Hospital; the trend graphs have been presented to the Infectious Disease Division and Infection Control. As the participants and scope of FA-Trend expands it will be possible to demonstrate, in real time and in high resolution, the spread of various infectious pathogens.

Funding source: Biofire minigrant.

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ROLE OF CHILD LIFE SPECIALISTS IN PEDIATRIC PALLIATIVE CARE

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Submission Category: Resident

Introduction: Each year more than 500,000 children in USA cope with life threatening conditions. Many are hospitalized for long periods for curative treatment or end of life are.

Background: Child life specialists help children and their families navigate the emotionally and physically demanding process of coping with hospitalization. They use their knowledge of child development to provide physical, emotional, social and psychological support. Play therapy, expression through art, magic and music therapy promote effective coping, reduce anxiety, and provide emotional support in the last days of the child with terminal illness.

Case Description: A 14 year old boy suffering from progressive ependymoma with hydrocephalus was admitted with worsening respiratory distress and bulbar dysfunction with evidence of multiorgan failure. He was depressed, moody, refused to talk to any providers and had very poor coping skills. On Day 10 of hospitalization, the Child life specialist introduced a magician who visited him daily to show him card tricks. The primary aim of bringing magic to this patient was to improve his quality of life by relieving symptoms of pain, decrease agitation, increase relaxation, and address symptoms of depression. Perhaps magic allowed him to believe that impossible things can be achieved and subsequently provided him a subconscious feeling of hope for the future. It became a source of comfort for the patient and family and helped him to preserve dignity and ameliorate suffering. After he died, the family expressed gratitude and summarized that this relationship helped them to accept death. It also helped Child life to build legacy with the family and provide footprints for future work.

Conclusions: Child life services provide children with opportunities to engage in normal play and recreational activities that promote growth, development, and feelings of success and fulfillment. They also promote the role of parents and other family members as full partners in the health care team. They use various tools like music, art and MagicAid to address physical, psychological, cognitive and social functioning. MagicAid is an intervention that is adaptable and flexible to a patient’s needs, and provides an opportunity for patients to feel empowered and encourages them to express feelings. As our current health care system grows, we would need Child life specialists to be the core members of the Pediatric Palliative Care services.
DISCHARGE BREASTMILK FEEDING RATES IN ASYMPTOMATIC TERM NEWBORNS ADMITTED TO THE NEONATAL INTENSIVE CARE UNIT FOR MATERNAL CHORIOAMNIONITIS

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Introduction: Neonatal Intensive Care Unit (NICU) admission affects exclusive breastmilk (BM) feeding rates. Among asymptomatic term neonates admitted to the NICU for maternal chorioamnionitis, we hypothesized that prolonged (>48 h) antibiotic exposure is associated with reduced discharge exclusive BM feeding rates compared to infants receiving standard (48 h) antibiotic courses. Our study aims to compare discharge BM feeding rates among asymptomatic term newborns receiving 48 h vs. >48 h antibiotics in the NICU and a cohort of well-baby nursery (WBN) newborns.

Methods: This retrospective chart review included asymptomatic term neonates admitted to the NICU due to maternal chorioamnionitis between Jan, 2012 and Dec, 2015. Exclusion criteria consisted of any respiratory support, hypoglycemia, and use of intravenous fluids. A comparison group of term WBN neonates were additionally studied. Demographic, birth, feeding, and lactation consultant (LC) visit data were analyzed in univariate and multivariate models.

Results: Among 272 NICU neonates, 237 (87%) received 48 h antibiotics vs. 35 (13%) who received > 48 h antibiotics; a cohort of 428 WBN neonates was studied for comparison. Exclusive BM feeding was seen in 15% of NICU vs. 35% of WBN neonates (p < 0.01). Exclusive formula feeding was seen in 24% of NICU vs. 4% of WBN neonates (p < 0.01). Combined feeding occurred in 61% of NICU vs. 61% of WBN neonates (p = NS). Among NICU newborns, 48 h vs. >48 h antibiotics was not associated with altered discharge BM feeding (13% vs. 14%; p = NS). Among all babies, WBN admission (p < 0.001), vaginal delivery (p = 0.05), older maternal age (p < 0.001), lower parity (p = 0.001), higher birth gestational age (p = 0.02), and more LC visits (p = 0.001) were associated with increased discharge BM feeding. Among NICU subjects, older maternal age (p = 0.003), lower parity (p = 0.017), first-feed breastmilk (p < 0.001), and more LC visits (p = 0.008) were all associated with increased discharge BM feeding. In the WBN, older maternal age (p = 0.022) and lower parity (p < 0.001) were associated with increased discharge BM feeding.

Conclusions/Clinical Relevance: NICU admission for maternal chorioamnionitis was associated with reduced discharge BM feeding in asymptomatic term neonates, but prolonged antibiotic exposure was not. We speculate that demographic variables, such as maternal age and parity, may aid in focusing lactation consultant efforts to potentially improve exclusive BM feeding rates at discharge.

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COMPARISON OF ACCESS TO CARE IN VETERANS VERSUS NONVETERANS WITH CARDIOVASCULAR DISEASE

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Submission Category: Graduate Student

Introduction: Improved access to care and quality of care can mitigate population level risk of heart disease and improve health outcomes. We sought to compare access to care in veterans versus nonveterans with cardiovascular disease (CVD) in the U.S.

Methods: The 2013 Centers for Disease Control’s Behavioral Risk Factor Surveillance Survey was utilized to identify a cohort of 57,171 adults with cardiovascular disease. Presence of cardiovascular disease (CVD) was noted with a single affirmative response to the following questions: “Has a health care professional ever told you that you had any of the following:” (1) a heart attack or myocardial infarction, (2) angina or coronary heart disease, (3) a stroke? Demographic data, clinical history and medication use were recorded in these patients. Bivariate analysis and multivariable logistic regression models were used to compute the results using SAS 9.4.

Results: Among 57,171 adults with CVD studied, 13,205 (23%) were veterans while 43,966 (77%) were non-veterans. Veterans with CVD tended to be older (p<0.0001), male (96% vs 33%, p<0.0001), white (85% vs 77%, p<0.0001), married (57% vs 41%, p<0.0001), college-educated (61% vs 48%, p<0.0001), homeowners (81% vs 70%, p<0.0001), and with higher annual income. They were also less likely to be of Hispanic ethnicity (3% vs 6%, p<0.0001) and actively working (16% vs 21%, p<0.0001). Veterans with CVD were more likely to be taking antihypertensive medications (93% vs 92%, p<0.0001) and had lower rates of current smoking (15% vs 19%, p<0.0001), chronic obstructive pulmonary disease (22% vs 23%, p=0.0003), asthma (13% vs 21%, p<0.0001), obesity (32% vs 37%, p<0.0001), physical inactivity (37% vs 44%, p<0.0001), and depressive disorders (22% vs 31%, p<0.0001). Veterans with CVD were less likely to report financial barriers to medical care (8% vs 16%, p<0.0001) and to medication costs (6% vs 15%, p<0.0001) and had higher rates of blood sugar testing (77% vs 72%, p<0.0001), blood cholesterol testing (98% vs 97%, p<0.0001), flu shot administration (64% vs 57%, p<0.0001), and annual check-up by a health care provider (89% vs 85%, p<0.0001). Veterans with CVD were more likely to be taking aspirin (77% vs 70%, p<0.0001). In multivariate analysis, being a veteran was associated with decreased odds of financial barriers to care (OR=0.82, CI 0.73-0.92, P=0.0006) and financial barriers to medication cost (OR=0.56, CI 0.48-0.64, P<.0001). Compared to non-veterans, veterans had increased odds of medical checkup in past year (OR 1.25, CI 1.13-1.38, P<.0001), cholesterol check in past year (OR 1.21, CI 1.07-1.37, P=0.0025), and flu shot (OR 1.22, CI 1.14-1.30, P<.0001).

Conclusions: Veterans with CVD receive improved access to care compared to their non-veteran counterparts.
A NON-ENZYMATIC ROLE FOR A VIRAL URACIL DNA GLYCOSYLASE INDEPENDENT OF HOST UNG IN HERPESVIRUS PATHOGENESIS

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Submission Category: Graduate Student

Introduction: All herpesviruses encode a viral uracil DNA glycosylase with conserved enzymatic activity to remove uracil from DNA, allowing initiation of the base excision repair to restore DNA fidelity. Murine gammaherpesvirus 68 (MHV68) infection of mice serves as a model pathogen system to identify viral and host determinants of gammaherpesvirus (gHV) diseases. We previously reported that the viral UNG (vUNG) of MHV68 is dispensable for replication in cell culture, yet is critical for viral pathogenesis in the host. To determine if uracil excision is the mechanism for vUNG function, we generated a panel of mutant viruses lacking the enzymatic activity of vUNG and the viral dUTPase. In addition, we performed novel pathogenesis studies in UNG knockout (UNG⁻⁻) mice to test whether the host UNG performs redundant functions.

Methods/Results: We generated recombinant viruses with mutations in the enzymatic sites of the vUNG alone (vUNG.ED), and a combination of mutations in the enzymatic sites of the vUNG and the viral dUTPase (vUNG.ED/dUTPase.ED). We verified the mutant vUNGs were expressed during infection and that uracil excision activity was absent. Both viruses had normal replication kinetics in UNG⁻⁻ fibroblast cells. Next, we investigated the pathogenesis of the mutant viruses in mice. The combinatorial vUNG.ED/dUTPase.ED demonstrated a log defect in acute replication in the lungs. However, the single vUNG.ED mutant has normal replication kinetics, in marked contrast to the severe defect of the vUNG.null virus. Interestingly, these defects were not exacerbated in the absence of host UNG.

Conclusions: Our genetic approach has revealed several novel findings. We report that the host UNG does not compensate for the absence of the viral UNG, suggesting non-redundant functions by the vUNG. Interestingly, the catalytic function of the vUNG is dispensable for acute replication unless the dUTPase function is also lost. This indicates that non-enzymatic functions of the vUNG, possibly via scaffolding interactions with the replication proteins likely play a critical role. In addition, we are currently examining if the viral genome is destabilized by uracil incorporation that likely occurs in the absence of both vUNG and viral dUTPase activities. We propose that the UNG and dUTPase de herpesviruses may provide novel targets for intervention of viral replication, to better combat gammaherpesviruses that are associated with cancers.

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ROLE OF HUMAN-SUPPORT IN THE CONTEXT OF
INTERNET-BASED THERAPEUTIC INTERVENTIONS
FOR DEPRESSION AND ANXIETY DISORDERS: A SCOPING REVIEW

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Introduction: Internet-based behavioral health interventions (IBHI) for psychological disorders show utility similar to in-person therapy, suggesting its potential as an accessible and cost-effective alternative to in-person psychotherapy. While human support varies the degree of treatment outcomes and adherence to IBHIs, the relationship between intensity or mode of human support and its effect on treatment outcomes has not been fully examined. This review aimed to examine the extent of research on the role of human support in IBHIs for depression and anxiety disorders, summarize the findings, and identify relevant research gaps.

Methods: A scoping review of randomized controlled trials (RCTs) exploring the role of human support in the context of IBHI were conducted. Two independent reviewers screened citations, selected eligible studies based on pre-defined inclusion criteria, and extracted data using a standardized form. The key information was analyzed, collated, and summarized.

Results: We identified 20 RCTs exploring the role of human support in IBHI. Support features were categorized by six variables – presence of guidance degree of support, level of therapist expertise, schedule of support, human factor, delivery mode, and the synchronicity of the communication platform. Only one support variable, schedule of support (structured support over non-scheduled support), had significant effect on treatment outcome. Varying degree of support, therapist expertise, delivery mode and synchronicity of communication did not affect the treatment outcomes. There were mixed findings regarding the presence of guidance and human factors.

Conclusion: There are a number of human support variables in the context of IBTI for the treatment of depression and anxiety disorders. It is unclear if the guidance is necessary to improve the effectiveness of IBTI or whether human support is superior to automated support. Providing structured support in a fixed-interval schedule is recommended to enhance the utilization of IBTIs. The degree/quality of support, therapist expertise, delivery modes, and synchronicity of the communication platform may not have an impact on treatment outcome; therefore cost-effective modes of human-support may be selected and utilized to supplement IBTI. However, the findings should be interpreted with caution due to the limited number of available studies. Further research is needed to draw robust conclusions concerning the clinical effectiveness and utility of various support methods for IBTIs.

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ASSESSMENT OF PATIENT HANDBOFFS BEFORE AND AFTER AN INSTITUTION-WIDE IMPLEMENTATION OF THE I-PASS BUNDLE: A SINGLE CENTER’S EXPERIENCE

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Submission Category: Medical Student

Introduction: The I-PASS study, a multi-center pediatric communication and patient-safety trial, found that implementation of a bundled intervention to improve communication during patient handoffs was associated with a 30%-reduction in preventable adverse events. Winthrop-University Hospital (WUH) underwent a hospital-wide implementation of the I-PASS bundle to standardize care across primary mid-level provider teams.

As a broader enterprise, this project seeks to evaluate whether similar improvements in outcomes and provider experiences demonstrated in prior department-based studies of the I-PASS bundle can be achieved in a hospital-wide transformation. This specific report focuses more narrowly on quantifying I-PASS adoption and measuring quality of written handoffs 4-6 months after implementation.

Methods: We conducted a prospective intervention study of the handoff-improvement program measuring the documentation of illness-severity and contingency-planning one month prior and 4-6 months after implementation. More than 400 WUH mid-level providers underwent standardized training that included TeamSTEPPS education, a 1-hour verbal-handoff simulation, and a 20-minute demonstration of the electronic I-PASS template. Data was collected from five distinct sign-out sessions before implementation and five after for the 18 primary mid-level provider services that use the hospital’s EHR. I-PASS adoption was measured by the proportion of patients within each service that have electronic I-PASS templates.

Results: 16 of 18 services had some level of I-PASS adoption. CCU (100%,57/57), MICU (100%,64/64), Medicine-Resident (98.93%,277/280), Medicine-Telemetry (97.24%,211/217), Pediatrics (96.81%,91/94), TCV-Floor (95.56%,43/45) had near-universal adoption (>95%). TCV-SICU and Cath/EP had 91.89% (34/37) and 87.5% (28/32) adoption, respectively. Services that had moderate adoption included MFM/GYN/GYN-ONC (75.24%,79/105), Neurosciences (65.38%,51/78), Orthopedics (60.00%,69/115), and SICU (41.3%,19/46). The following services had little adoption: PICU (23.53%,4/17), Trauma (16.67%,5/30), General-Surgery (13.04%,33/253), Wound-Care (11.43%,8/70). Two services did not adopt the I-PASS template (Urology, OB).

In our data set, 7.24% (140/1933) of patients compared with 42.77% (796/1861) had documentation of illness-severity pre- and post-implementation. Contingency-planning was documented in 8.17% (158/1933) of patient’s pre-implementation compared with 33.05% (615/1861) 4-6 months after implementing I-PASS.

Conclusion/Clinical Relevance: WUH’s efforts to implement a standardized handoff system showed disparate rates of adoption among the services. The hospital-wide handoff improvement program effected significant change in important measures of handoff quality.
IMPACT OF GENDER ON MORTALITY IN ADULTS UNDERGOING TRANSCATHETER OR SURGICAL AORTIC VALVE REPLACEMENT: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Title category: Medical Student

Introduction: Limited data exists regarding gender differences in outcomes following transcatheter (TAVR) and surgical aortic valve replacement (SAVR). We sought to review the published data and perform a systematic review to investigate differences in mortality between men and women following TAVR and SAVR.

Methods: We systematically searched Medline from 1972 to July 2016 for randomized trials and observational studies examining the relationship between gender and mortality outcomes in patients following TAVR or SAVR. Two authors selected studies and extracted data independently. Studies were excluded if data regarding procedural (in-hospital or 30-day) all-cause mortality were not provided.

Results: There were 31 articles, a total of 39,652 patients, enrolled in our systematic review and meta-analysis, including 22,347 men and 17,305 women. Of these 31 articles, 16 involved TAVR, 13 involved SAVR, and 2 involved both TAVR and SAVR. Rates of procedural all-cause mortality (in-hospital or 30-day) following TAVR was noted to be similar in men and women [odds ratio (OR) 1.07, 95% confidence interval (CI), 0.94 to 1.22]. Men had lower rates of procedural all-cause mortality (in-hospital or 30-day) following SAVR compared to women (OR 0.71, 95% CI, 0.62 to 0.82).

Conclusions: Female gender is associated with higher rates of mortality following SAVR. No significant differences in mortality were noted in men versus women following TAVR.
FACTORS INFLUENCING HOSPITAL READMISSION IN CONGESTIVE HEART FAILURE PATIENTS

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Submission Category: Fellow

Introduction: Congestive Heart Failure (CHF) is one of the most common medical conditions receiving treatment in our hospitals and clinics. It encompasses patients of all ages and is associated with other co-morbid conditions, requiring an extensive medication regimen, involvement of multiple providers and frequent clinic visits. Furthermore, heart failure patients continue to have higher hospital readmission rates that are linked to increased mortality and medical cost to the patient as well as the health care system. The purpose of this study was to survey patients with heart failure and use their answers as well as their health record to determine factors that may contribute readmission rates.

Method: A survey was created to address key elements of heart failure including ejection fraction, signs and symptoms, dietary restrictions and indication for medications. The surveys were distributed in the cardiac units at Stony Brook University Hospital and affiliated outpatient cardiology and primary care clinics. Data such as medications, echo results, and laboratory data was collected from the patients’ charts. The data was recorded in a spreadsheet and analyzed using statistical software. The readmission rates were correlated with presence of hypertension, diabetes, atrial fibrillation, chronic obstructive pulmonary disorder and chronic kidney disease and use of guideline based heart failure therapy. Prior history of stroke, cardio-pulmonary bypass graft surgery, angioplasty and device implantation as well as fixed factors such as age, race, gender and ethnicity were also included in the study.

Results: The mean age range of the patients was 75. There was no difference in re-admission rate as it relates to ethnicity. There was a positive correlation between re-admission rates and other factors such as use of guideline based heart failure therapy. Age and lower systolic function had a significant positive correlation on re-admission rates while gender did not. The presence of the comorbid conditions mentioned above was more common in those with more readmissions.

Conclusion: CHF continues to increase in prevalence and is one of most common reasons for hospital admission. As many other prior studies have shown, our study showed a high readmission rate for both systolic and diastolic heart failure patients. These patients are most commonly older in age and have other coexisting conditions that make their care more intricate. Using surveys to gaining understanding of patient knowledge is useful to help providers focus on areas of improvement as well as success in patient care.
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Submission Category: Faculty

Objective: We report a case of a unilateral rheumatoid nodule found on the vocal fold of a patient with diagnosed Rheumatoid Arthritis that recurred 18 months after surgical resection and regressed with restarting her immunosuppressants.

Methods: This is a case report and review of the literature concerning the occurrence of rheumatoid nodules on the vocal folds in the setting of rheumatoid arthritis.

Results: Laryngeal manifestations of Rheumatoid Arthritis (RA) are broad and can lead to permanent aphonia if not treated properly. We describe a case of a rheumatoid nodule that developed on the vocal fold in a female patient with a known history of RA who discontinued treatment with Methotrexate and Etanercept and started high dose corticosteroids. The patient developed near aphonia over the course of six months and was found to have a unilateral rheumatoid nodule on her left vocal fold. After surgical resection, her nodule recurred on the same side of the vocal fold, but more posteriorly than the first. After restarting Methotrexate and Etanercept, the nodule decreased in size and her symptoms improved.

Conclusion: Previous literature has postulated that rheumatoid nodules occur in locations that are under a greater amount of shearing forces, such as the middle third of the vocal fold during phonation. In the current case, the location of the rheumatoid nodule was in the distal most third of the vocal fold, and was unilateral. Further research must be done to understand the etiology of rheumatoid nodules in the larynx and how to better prevent and treat them in the future.
AN UNUSUAL CASE OF RECTAL FOREIGN BODY: A CASE REPORT

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Submission Category: Resident

Introduction: Shunt systems are associated with various complications such as infection and malfunction (1). Ventriculoperitoneal Shunts especially, are associated with abdominal complications such as peritoneal pseudocysts, abdominal wall perforation, bowel perforation, and protrusion outside of the body (2).

Case/Methods: A 16 year old female presented to the Emergency Room with rectal foreign body found by the home health aide. The patient is ventilator dependent and is a quadriplegic due to C2 fracture from a motor vehicle accident that she suffered approximately 7-8 years prior to presentation. Shortly after suffering this injury, the patient developed hydrocephalus now status post Ventriculo-Peritoneal (VP) shunt placement, which was performed 8 years prior to presentation. The patient also has chronic constipation for which she receives a daily bowel regimen including rectal stimulation. On the night of presentation, the patient’s home nurse noted a tube-like structure in the rectal vault, pulled on it, and subsequently became concerned that this may be the patient’s VP shunt. The tube was now protruding out of the patient’s anus with clear fluid draining from the tip. In the ER, on physical exam the patient was afebrile, alert, well appearing, at neurologic baseline with abdomen soft, nontender, nondistended. On rectal exam she was noted to have approximately 2-3 cm of white tubing protruding out of the anus with clear fluid drainage. A shuntogram and head CT without contrast were done. Shuntogram showed the distal aspect of the VP shunt catheter following the course of the rectum, but no intestinal obstruction or pneumoperitoneum. Head CT was negative for hydrocephalus or any midline shift. The patient was taken to the Operating Room for removal of the distal catheter from the abdomen and rectum. An External Ventricular Device was placed for 8 days and thereafter a VP shunt was placed with positioning confirmed via CT scan and shuntogram.

Discussion: VP shunt complications are common, occurring in 45-59% of pediatric patients (3) with the highest rate being within the first year of shunt placement (4). In regards specifically to shunt migration, it is rare occurring in 0.01-0.07% of cases but dangerous as it is associated with intracranial and intraabdominal infections with a mortality rate of 15% (5).

Conclusion: This case illustrates the potential for VP shunt complication, namely shunt migration, with very little symptomatic evidence. Although migration is a known complication of VP shunt, this case is unique in that the event seemingly occurred many years after the initial placement of the shunt. This emphasizes the importance of careful surveillance and a thorough History and Physical in a patient with a VP shunt.
PREVENTION OF CLOSTRIDIUM DIFFICILE INFECTION IN PEDIATRIC HEMATOLOGY/ONCOLOGY PATIENTS

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Submission Category: Resident Submission

Introduction: *Clostridium difficile* (*C. difficile*) is spread via fecal oral route and is the leading cause of hospital-associated diarrhea in U.S. hospitals, including in children though data limited. Individual risk factors for *C. difficile* infection (CDI) include antimicrobial exposure, hospitalization, immunocompromised or chronic health conditions, chemotherapy and use of proton pump inhibitors. Additional risk factors are contact with a health care worker, contact with a contaminated environment, or direct contact with a CDI patient. Due to the situation in the Pediatric Hematology/Oncology patients, healthcare providers are essential to control the spread of infection. In 2014, an increase in CDIs was observed in Pediatric Hematology/Oncology patients. At Stony Brook Children’s Hospital, the rate for *C. difficile* infections for Pediatric Hematology/Oncology patients prior to this initiative was 48.6/10,000 pt days. Given the significant increase in the incidence of this infection in our patients, we have undertaken this project to identify and remediate the causes.

Methods: This quality improvement initiative included all hospital staff that interacted with these patients including ED, PICU, Heme/Onc, ID, Child Life, Nurses, House Staff, staff at the Cancer Center, respiratory therapists, and Hospital Custodial Staff (HCS). Education interventions in the form of a power-point presentation, brochures, and daily/terminal cleaning checklists were created to assist in spreading awareness and informing staff on cleaning practices. All staff were given pre and post-educational questionnaires to assess current knowledge of *C. difficile*. Observations of cleaning practices of the HCS staff were conducted. Bioburden tests performed in playrooms in the Cancer Center and on the unit.

Results: Since implementation of our *C. difficile* quality improvement initiative, rates of *C. difficile* have decreased by 61% in Pediatric Hematology/Oncology patients. The post-educational questionnaire data collected also shows improvement in scores. Overall, knowledge pertaining to ordering of *C. difficile* testing improved but there was a decrease in understanding about the benefits of foaming in and out of patient rooms. Several toys such as the “soccer game” did not pass bioburden inspection.

Conclusions: Our quality improvement initiative has led to a decrease in *C. difficile* rates among our patients. We hope to continue education routinely to further improve rates and anticipate a Children’s Hospital wide initiative. Bioburden results should continue to be used to monitor environmental risks and education of volunteer staff on cleaning in the play areas and the HCS in patient rooms.
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Submission Category: Graduate Student

Introduction: Krüppel-like factor 5 (KLF5) is a zinc-finger transcription factor regulating homeostasis of the intestinal epithelium. Our previous study shows that KLF5 regulates maintenance of intestinal crypt architecture and epithelial barrier function (McConnell BB et al., Gastroenterology 2011; 141:1302-13).

Aim: To assess the mechanism by which KLF5 regulates barrier function of intestinal epithelial cells both in vitro and in vivo.

Methods: We established inducible KLF5 knockdown in Caco-2 BBBe cells using a lentiviral Tet-on system and generated two intestine-specific Klf5 knockout mouse models (Villin-Cre;Klf5²/fl and Villin-CreERT²;Klf5²/fl). We used transepithelial electrical resistance (TEER) measurement and FITC-dextran 4kD permeability assay to assess the formation of epithelial barrier function in KLF5 knockdown and control Caco-2 BBBe cells grown on transwell plates. Mouse gut permeability was measured with FITC-dextran 4kD gavage. Furthermore, inducible DSG2 knockdown and constitutive DSG2 overexpression in inducible KLF5 knockdown in Caco-2 BBBe cells were established to validate the role of DSG2 in KLF5-mediated barrier function. We examined expression levels of cell junction components using qPCR and Western blotting methods. Immunofluorescent staining was applied to study the distributions of the cell junction proteins, and transmission electron microscopy was used to demonstrate the morphological changes. In addition, we tested the effects of KLF5 levels on desmoglein-2 (DSG2) promoter activity in HEK293T cell line, and ChIP confirmed the binding sites for KLF5.

Results: Induction of KLF5 knockdown in cultured cells led to impaired epithelial barrier function as indicated by decreased transepithelial electrical resistance (TEER) and increased paracellular permeability to small molecule FITC-dextran (4kDa). Villin-Cre;Klf5²/fl mice and tamoxifen injected Villin-CreERT²;Klf5²/fl miceboth showed increased gut permeability to FITC-dextran compared to Villin-Cre control mice, and corn oil injected Villin-CreERT²;Klf5²/fl mice, respectively. Desmoglein-2 (DSG2), a desmosomal cadherin, was significantly decreased at both protein and mRNA levels in KLF5 knockdown cells. Consistently, the electron microscopy study demonstrated altered morphology of desmosome complexes in KLF5 knockdown cells. The DSG2 knockdown cells exhibited decreased TEER and increased permeability to FITC-dextran, while the overexpression of DSG2 enhanced the epithelial barrier function. Results of immunostaining of DSG2 in colonic tissues from Villin-Cre;Klf5²/fl mice and tamoxifen injected Villin-CreERT²;Klf5²/fl mice are consistent with those of in vitro studies. The promoter assay for DSG2 showed that KLF5 enhances its transcription, and ChIP results confirmed the binding sites for KLF5.

Conclusions: Our data show that KLF5 regulates intestinal barrier function by mediating the expression of DSG2, a major component of desmosome structures.

Funding source: NIH/NIDDK DK093680
BOVINE ACELLULAR DERMAL MATRIX (SurgiMend®) VERSUS PORCINE ACELLULAR DERMAL MATRIX (Strattice®) FOR ABDOMINAL WALL RECONSTRUCTION: A COST ANALYSIS STUDY

Authors: Johanna D’Agostino MD, Catherine Sinnott MD, Malack Hamade BS, David Rivadeneira MD, Manal Hegazy MD, Michael Dobryansky MD.

Submission Category: Medical Student

Introduction: Ventral hernia repair by component separation and placement of acellular dermal matrix (ADM) mesh is most commonly performed with porcine acellular dermal matrix (Strattice®) mesh. Bovine acellular dermal matrix (Surgimend®) has the advantages of being less expensive and available in different thicknesses; however, its use in abdominal wall reconstruction has not been well defined. The purpose of this study is to show that Surgimend® can be used for abdominal wall reconstruction with acceptable outcomes and complication rates and significantly less cost compared to Strattice®.

Methods: A retrospective chart review was performed of all patients who underwent abdominal wall reconstruction for ventral hernia repair with component separation and placement of Surgimend® mesh performed by a single reconstructive surgeon. Patient demographics and wound complications were reviewed and clinical outcomes were assessed from one month to 17 months postoperatively. The hospital cost of the Surgimend® mesh used in each case was compared to the cost of an equivalently-sized piece of Strattice® mesh.

Results: 22 patients (11 male and 11 female) with a mean age of 58.3±11.2 (mean±SD) years met the inclusion criteria. Mean BMI was 31.7±7.1 and the mean number of previous abdominal surgeries was 3.2±1.5. Seven of the 22 patients (31.8%) were active smokers and 1 patient (4.5%) was diabetic. Postoperative wound infections occurred in 4 of 22 patients (18.2%). One of the postoperative wound infections involved a concomitant seroma and was managed by operative incision and drainage and one was treated by IR drainage. The other two cases of wound infection were managed with local wound care with or without VAC therapy. Postoperative partial wound dehiscence without mesh exposure occurred in 8 of 22 patients (36.4%). There were no cases of hematoma, PE or mortality and there were no recurrences over a mean follow-up period of 3.0±0.8 months. The mean cost of Surgimend® mesh used in these cases was $11,785.00±2,400, and was significantly less than the mean cost of equivalently-sized Strattice® mesh ($12,945.27±2,415; p<0.001).

Conclusions: Ventral hernia repair can be performed safely by component separation and placement of Surgimend® with acceptable complication rates and outcomes at significantly less cost compared to Strattice®.
DIVERSE APPLICATIONS OF AUTOLOGOUS
FAT TRANSPLANTATION IN WOUND
HEALING AND RECONSTRUCTION

Authors: Catherine J. Sinnott MD, Malack Hamade BS, Thomas Davenport MD

Submission Category: Medical Student

Purpose: Autologous fat transplantation has many diverse applications in wound healing and reconstruction and can be used as an adjunctive therapy, maximizing the effectiveness of other techniques. The aim of this study is to show the diverse applications of autologous fat transplantation and it use as an adjunctive therapy in wound healing and reconstructive surgery.

Methods: 16 patients underwent autologous fat transplantation by a single surgeon and their records were retrospectively reviewed. In all patients, fat was harvested manually after tumescence. Demographic data were reviewed and analyzed. Information on wound size, duration of the defect, volume of fat transplanted were also reviewed. Clinical outcomes were assessed 1-55 months postoperatively.

Results: Four of the sixteen patients underwent autologous fat transplantation as an adjunctive therapy in the treatment of chronic non-healing wounds by excisional debridement and the application of dHACM and skin grafts. The duration of the wounds prior to treatment was 9.4 ± 4.7 years, while the mean wound size was 33±16cm² and volume of fat transplanted was 51.2 ±25.6 mL. All four patient achieved complete wound closure without complications. Three of the sixteen patients underwent autologous fat transplantation as an adjunctive therapy to excisional debridement and the application of dHACM without skin grafting. One healed completely with 100% closure, one with 79% closure and one with 0% closure. Three of the sixteen patients had facial contour defects and neck scar contractures after mandibular reconstruction for oral squamous cell cancer (SCC). The mean duration of the defects before treatment was 2±1.2 years and the mean volume of fat transplanted was 9.0±5.2 mL. All three patients achieved significant improvements in contour defects and scar contractures without complications following fat grafting treatment. Six of the sixteen patients were treated for contour defects and atrophic changes. The mean duration of the contour defects before treatment was 1.3±0.6 years and the mean volume of fat transplanted was 13.3±1.0 mL. Five of the six patients achieved significant improvement in contour defects. One patient with scleroderma required several treatments of fat transplantation with minimal improvement in atrophic changes.

Conclusion: Autologous fat transplantation has diverse applications in wound healing and reconstruction and can be successfully used as an adjunctive therapy along with hHACM, with or without skin grafting, for achieving wound closure in chronic non-healing wounds.
FREQUENT SEQUENCE MINING ON CANCER DIAGNOSIS ON LONG ISLAND

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Submission Category: Graduate Student

Introduction: Analysis of the histories of large scale patients could imply comorbidity or demonstrate patterns of disease progression. Recently, open data initiatives make it possible to access large scale patient data for such studies. For example, New York State Statewide Planning and Research Cooperative System (SPARCS) is a comprehensive all payer data reporting system that collects patient level information for hospital visits, including patients’ diagnosis codes, procedure codes, and demographic information. The goal of this study is to discover frequent disease subsequences of cancer patients on Long Island using SPARCS data.

Methods: We use the Clinical Classifications Software (CCS) for ICD-9-CM and focus on primary diagnosis codes only. There are 4,391,589 patients on Long Island and 35 cancer-related CCS groups. We study disease histories of patients from every cancer group. We first group each patient’s discharge records via unique patient identifiers to generate the full histories of each patient. Then select the primary diagnosis code from each discharge record and obtain a sequence based on CCS groups of every patient. We then use sequence mining algorithm to generate most frequent CCS subsequences among patients in each cancer group.

Results: We use <cancer1, cancer2>, which means ”cancer1 happens before cancer2 in a sequence”, to represent subsequences in our findings. Among patients with esophagus cancer, around 18.18% of them have the pattern <esophagus cancer, stomach cancer>, while about 21.39% of them have the subsequence <stomach cancer, esophagus cancer>. For patients with stomach cancer, 14.16% have the pattern <stomach cancer, esophagus cancer>, and 12.04% have the pattern <esophagus cancer, stomach cancer>. For patients who suffer from cancer of rectum and anus, 19.09% have the pattern <rectum and anus cancer, colon cancer>, while 14.43% have the pattern <colon cancer, rectum and anus cancer>.

Conclusions: We are able to provide comprehensive results on the most frequent sequences of cancer types, which provide essential knowledge on cancer progression or correlations. Frequencies of one potential interesting sequence of cancer types and its reversed subsequence are different. One ongoing work is using both primary diagnosis codes and secondary diagnosis codes to obtain a more comprehensive disease history for each patient.

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IMPACT OF DEPRESSIVE DISORDER ON ACCESS TO CARE AND QUALITY OF CARE IN VETERANS WITH CARDIOVASCULAR DISEASE

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Submission Category: Graduate Student

Introduction: Depressive disorders have been independently associated with increased morbidity and mortality in adults with cardiovascular disease (CVD). We sought to assess the association between depressive disorder and access to care and quality of care among U.S. veterans with CVD.

Methods: The 2013 Centers for Disease Control’s Behavioral Risk Factor Surveillance Survey was utilized to identify a cohort of 13,126 veterans with CVD. Presence of CVD was noted with a single affirmative response to the following questions: “Has a health care professional ever told you that you had any of the following:” (1) a heart attack or myocardial infarction, (2) angina or coronary heart disease, (3) a stroke? Demographic data, clinical history and medication use were recorded in these patients. Bivariate analysis was performed to analyze the demographic characteristics, medical history, quality of care and access to care. Multiple imputation process using the fully conditional specifications method (FCS) was used to determine association between depressive disorder and variables of access to care and quality of care.

Results: Among 13,126 veterans studied, a total of 2,889 (22.0%) adults had a depressive disorder while 10,237 (78.0%) did not. Veterans with a depressive disorder tended to be younger (p<0.0001), female (7% vs 4%, p<0.0001), non-white (21% vs 14%, p<0.0001), and of Hispanic ethnicity (4% vs 2%, p<0.0001). There were less likely to be married, employed, homeowners and reported lower annual income. Veterans with a depressive disorder had higher rates of hypertension (78% vs 73%), hypercholesterolemia (76% vs 67%), chronic kidney disease (12% vs 8%), chronic obstructive pulmonary disease (33% vs 18%), asthma (20% vs 11%), smoking (25% vs 12%), obesity (40% vs 30%), and physical inactivity (45% vs 35%) (p<.0001 for all). Veterans with depressive disorder were more likely to report financial barriers to medical care (15% vs 6%, p<0.0001) and to prescription costs (12% vs 5%, p<0.0001), and delay in receiving medical care (24% vs 9%, p<0.0001). While no difference was noted in annual blood cholesterol check, blood sugar testing, flu shot administration, veterans with depressive disorder reported significantly lower rates of aspirin (73% vs 78%, p=0.0003) and antihypertensive use (92% vs 94%, p<.0001). In multivariate analysis, depressive disorder was associated with independently higher rates of financial barriers to medical care (OR, 1.96; 95% CI, 1.45–2.65), financial barriers to prescription drugs (OR, 1.45; 95% CI, 1.02-2.08) and delay in receiving medical care (OR, 2.07;95% CI, 1.65-2.60).

Conclusions: Depressive disorder was associated with higher rates of financial barriers to care and prescription drugs and patient reported delays in medical care in U.S. veterans with CVD. Further research appears warranted to evaluate the impact of mental health disease upon cardiovascular care in veterans with CVD.
A PILOT STUDY EVALUATING THE CURRENT INCIDENCE AND RISK FACTORS FOR ANTHRACYCLINE CARDIOTOXICITY IN PATIENTS WITH ACUTE MYELOID LEUKEMIA UNDERGOING INTENSIVE THERAPIES

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Submission Category: Resident

Introduction: Cardiotoxicity from anthracyclines during treatment for acute myelocytic leukemia (AML) remains a significant limiting factor in overall mortality. We sought to determine the incidence of and risk factors for anthracycline-induced cardiovascular toxicity at our institution.

Methods: We performed a retrospective chart review of 92 patients with AML who received induction chemotherapy with an anthracycline between January 1, 2009 and December 31, 2015. Anthracycline cardiotoxicity was defined according to the American Society of Echocardiography and European Association of Cardiovascular Imaging guidelines, as a decrease in the left ventricular ejection fraction (LVEF) of >10%, to a value <53%.

Results: The mean age of patients was 55 ±13.4 years and 35.9% were females. Of the 78 (84.8%) patients who received post-chemotherapy echocardiographic imaging, 20.5% (n=16) met criteria for cardiotoxicity. Overall, the average LVEF decreased from 63±6.4 to 56.7 (±10) (p<0.0001). There was no significant difference in the LVEF change between the higher and lower mean cumulative doses of anthracyclines (p=0.78). Further analysis did not reveal any statistically significant risk factors for developing anthracycline cardiotoxicity.

Of the patients with cardiotoxicity, 6 (37.5%) were initiated on an angiotensin converting enzyme inhibitors or angiotensin receptor blockers, 8 (50%) on a beta-blocker, and 7 (43.8%) on a diuretic. Nine (56.2%) did not have cardiology follow up. Patients with cardiotoxicity had a higher incidence of major adverse cardiac events.

Conclusion: In our retrospective patient cohort, there was a statistically significant drop in LVEF from baseline to follow up in those who had follow-up echocardiograms. There was, however, no significant difference in LVEF between the higher and lower anthracycline dose groups. More data is needed to evaluate for anthracycline cardiotoxicity risk.

Not all patients who met criteria for cardiotoxicity with left ventricular dysfunction (LVD) were initiated on optimal heart failure medications nor seen by a cardiologist. The implementation of a standard protocol for cancer patients receiving cardiotoxic medications may enable better detection and early management of LVD before the onset of clinical heart failure.

CORIHS approval date: 04/21/2016

CORIHS approval number: 861851
DSRIP CARE MANAGEMENT IN INTERNAL MEDICINE PRIMARY CARE

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Introduction: In 2009, 5% of the U.S. population accounted for half of health care costs. As healthcare providers, it is important to identify and proactively manage patients at high risk for negative outcomes and costly care.

Suffolk Care Collaborative (SCC) is a program under Delivery System Reform Incentive Payment (DSRIP), a statewide initiative to improve healthcare for Medicaid and uninsured patients. SCC includes a practice-embedded nurse care manager and network of social workers and community health associates working with primary care to identify biopsychosocial needs.

Patients are identified as eligible for care management through either an algorithm or direct referral from primary care providers (PCPs). Enrollment and communication processes are not standardized, with opportunities for improvement. The purpose of this study was to evaluate outcomes of the program thus far with regard to process and identification and resolution of biopsychosocial needs.

Methods: We conducted a chart review between 4/2016-1/2017 on patients identified using the SCC database. Primary outcomes to identify opportunities for improvement included source of referral, successful enrollment, number of communications between SCC and PCPs. Secondary outcomes included number of biomedical, psychiatric and social needs identified and addressed.

Results: 175 patients were identified as eligible for care management, 47% of which were enrolled. Of the patients identified as eligible, only 20% were referred by their PCP, with 77% of referrals coming from a Cerner-based algorithm and 3% from family members. Rates of enrollment from PCP referrals were more successful at 54% than through the algorithm (30%).

Of patients enrolled in the program, 69% had no communication in the chart between SCC and PCPs. Of the other 31% of cases, there was an average of 2.6 communications.

Of patients enrolled, 20 were identified who had biopsychosocial needs communicated between SCC and PCPs. Of the needs, 18/25 (72%) biomedical needs, 5/7 (71%) psychiatric needs and 6/11 (55%) social needs were addressed.

Conclusion: In the future, we should focus on increasing enrollment via direct referrals, which are more successful. We will implement a standardized workflow for referral and improve quality of communication between SCC and PCPs by using standardized templates to identify and address biopsychosocial needs of patients.

CORIHS Approval: The project was submitted through IRBnet as a QI initiative

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INTRODUCTION: Chronic inflammation may contribute to the etiology of multiple diseases that are particularly prevalent in older populations, including Alzheimer’s disease, atherosclerosis, and osteoarthritis. Melatonin, a hormone produced in the pineal gland known to be responsible for circadian rhythms, has been found to play a complex role within the immune system, including an anti-inflammatory effect. While there are many animal studies confirming this effect, few human clinical trials have been done. This study aims to find out if exogenous melatonin reduces levels of inflammatory markers (e.g., IL-6, TNF-α, and IL-8) in humans.

METHODS: We searched PubMed, EMBASE, Cochrane Library, Scopus, and PsycINFO, and the references of the identified articles for randomized placebo controlled clinical trials. Data were extracted from the articles and a meta-analysis was conducted using the random effects model to calculate the standardized mean difference (Cohen’s D effect size).

RESULTS: Sixteen studies that met inclusion criteria were included from an initial search result of 3,746 studies. Melatonin had a large effect on IL-6 (effect size [ES], -5.97; 95% confidence interval [CI], -8.17 to -3.76), TNF-α (ES, -2.30; 95% CI, -3.71 to -0.88), CRP (ES, -3.05; 95% CI, -5.12 to -0.97), and IL-8 (ES, -21.06; 95% CI -27.27 to -14.85). After trimming for publication bias, melatonin had a large, significant effect on IL-6 (ES, -1.33; 95% CI, -1.61 to -1.041) and IL-8 (ES, 13.46; 95% CI, -18.88 to -8.04), but had a moderate, statistically insignificant effect on TNF-α (ES, -0.5; 95% CI, -1.38 to 0.33) and CRP (ES, 0.67; 95% CI, -2.06 to 0.73).

CONCLUSION: Exogenous melatonin reduced levels of anti-inflammatory markers. This study demonstrates that it is useful for prevention and adjuvant treatment for inflammatory disorders. Melatonin is safe and has few side effects, which makes it an ideal agent for prevention of inflammatory disorders. Because chronic inflammation increases with aging and inflammation plays a role in the etiologies of many diseases that affect older populations, melatonin has the potential to be widely used in patients over the age of 65. Because these patients also tend to be, on average, a greater number of medications due to medical comorbidities, melatonin is especially useful to them as it has very few drug interactions.

The research in this abstract was supported by 2T35AG026736-11. The investigators retained full independence in the conduct of this research.
NIX MEDIATES MITOPHAGY AND METABOLIC TRANSFORMATION IN PANCREATIC DUCTAL ADENOCARCINOMA

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Submission Category: Graduate Student

Introduction: Pancreatic cancer is the fourth-leading cause of cancer-related death in the U.S. and remains a largely intractable disease. Nearly all cases of pancreatic ductal adenocarcinoma (PDAC) are characterized by activating mutations in the KRAS gene. A better understanding of the metabolic changes induced by oncogenic KRAS expression may lead to the identification of potentially targetable vulnerabilities in pancreatic cancer cells. We have found that the expression of endogenous levels of oncogenic Kras suppresses mitochondrial content through a mitophagy program mediated by BCL2/Adenovirus E1B 19 kD protein-interacting protein 3-like (Bnip3l/Nix). The purpose of this study is to determine the role of Nix in the development and progression of PDAC.

Methods: We use a combination of a novel in vitro 3D pancreatic organoid culture system and genetically engineered and transplantable orthotopic mouse models to determine the role of Nix in PDAC.

Results: Our data demonstrate that the levels of Nix increase upon KrasG12D activation in vitro and in vivo and that Nix expression induces a metabolic program consistent with increased aerobic glycolysis. Loss of Nix in mouse and human pancreatic cancer cell lines leads to an increase in mitochondrial mass, a decrease in proliferation in glucose-limited conditions, and an increase in maximal respiration. Additionally, using genetically engineered and orthotopic transplant mouse models of Kras-mutant pancreatic cancer, we show that Nix ablation significantly impedes tumor growth in vivo.

Conclusions/Clinical Relevance: Collectively, our results uncover the role of Nix in promoting pancreatic cancer development and suggest new targetable vulnerabilities in pancreatic cancer cells.

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BIRTH TIME-DEPENDENT SPECIFICATION OF
PYRAMIDAL NEURON LAMINAR AND PROJECTION
TYPES THROUGH INTERMEDIATE PROGENIORS

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Submission Category: Graduate (MSTP) student submission

Pyramidal neurons (PyNs) comprise the majority of cortical neurons and underlie nearly all aspects of cognitive operations. The progenitor cells that give rise to neocortical PyNs mainly include radial glial cells (RGCs) and intermediate progenitor cells (IPCs) located in the embryonic cerebral ventricle wall. RGCs divide asymmetrically to generate neurons either directly or indirectly through IPCs, which divide symmetrically to produce pairs of PyNs. It remains unclear how progenitor types (e.g. RGCs, IPCs), their lineage progression, and timing of neurogenesis contribute to the specification of diverse PyN subtypes defined by axon projection, connectivity, and physiology. In particular, the role of IPCs in the generation of PyNs is poorly understood. The T-domain transcription factor Tbr2 is specifically expressed in cortical IPCs. We have generated an inducible Tbr2-CreER mouse driver, which allows comprehensive lineage tracing from IPCs and have developed a novel genetic method to fate-map neurons throughout embryogenesis according to their lineage and precise birth time by combining the driver with Cre-dependent reporter mice. In addition to assessing the laminar position of PyN subtypes, axon projections are analyzed with a novel method utilizing viral labeling of fate-mapped PyNs. Using retrograde virus along with our genetic driver and reporter lines allows us to restrict cell labeling by progenitor type, birth date, and projection target. With this method, we can further elucidate the PyN subtypes born from IPCs throughout neurogenesis, using axon projection as more descriptive definition of cell type than laminar location. Fate mapping experiments revealed that IPCs sequentially gave rise to PyNs with distinct laminar patterns spanning multiple nonconsecutive layers with only a trend towards an inside-out sequence. This suggests that IPCs do not generate PyNs in a strictly inside-out manner. Rather, temporal cohorts of multiple fate-restricted IPCs simultaneously, as well as sequentially, generate PyN subtypes defined by their axon projection and laminar location. These findings begin to link progenitor type and their time of neurogenesis to the specification of PyN subtypes. Understanding the role of IPCs will begin establishing how their dysfunction leads to disease. Loss of Tbr2 function contributes to a wide range of brain disorders in humans including intellectual disability in association with microcephaly, polymicrogyria and corpus callosum agenesis. The results of this study are relevant to understanding the pathogenesis of these disorders and more broadly, disorders of neurodevelopment including autism spectrum disorders.

Funding and Support: Ruth Kirschstein Individual F30 NRSA Fellowship – PA-14-150-NIMH
PROTEIN N-TERMINAL ACETYLATION IS ASSOCIATED WITH CARDIAC RHYTHM REGULATION

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Introduction: The major N-terminal acetyltransferase NatA co-translationally acetylates near 40% of human proteins; the biological implications of this modification are practically unexplored. Ogden syndrome, the first documented disorder with a genetic mutation (p.S37P) in Naa10, encoding the catalytic subunit of NatA, features a distinct combination of dysmorphic features, cardiac dysfunction, hypotonia, global developmental delays and growth failure. Using induced pluripotent stem-cell-derived cardiomyocytes (iPS-CMs), we present a model platform to investigate consequences of disrupted N-terminal acetylation on human cardiac rhythm regulation.

Methods: Primary skin fibroblasts from Ogden patient and control were reprogrammed into iPSCs via Sendai virus-mediated approach. iPS-CMs were obtained following a Wnt-signaling based differentiation protocol. The structural and electromechanical properties of these iPS-CMs are investigated in a high-throughput manner using a custom-developed, automated, all-optical platform (OptoDyCE). Real-time analysis of mitochondrial respiration and glycolytic flux of primary fibroblasts were evaluated by measuring the oxygen consumption rate and extracellular acidification rate respectively using an XF-96 Extracellular Flux Analyzer. Statistics analysis was done using 1-way ANOVA with Tukey-Kramer post-hoc test for a single experiment, and 2-way ANOVA with Tukey-Kramer post-hoc test for multiple independent experiments. All results are expressed as mean ± s.d. Differences were considered significant when P < 0.05.

Results: The pluripotency and genome integrity of all derived iPSC lines were confirmed. Proteomics revealed decreased N-terminal acetylation in some proteins important for mitochondrial and cardiac rhythm functions in patient cells. Patient primary fibroblasts revealed an altered bioenergetics and metabolism. Initial electrophysiological experiments suggest prolonged action potentials in patient iPS-CMs but unmasked only at slow pacing rates. Calcium transient morphology in patient iPS-CMs is preserved but with slightly slower upstroke; the consequences of these findings for wave propagation are under study.

Conclusion: The developed iPS-CMs model of Ogden syndrome and the employed all-optical platform OptoDyCE permit the first mechanistic investigation of the effects of N-terminal acetylation on cardiac electrophysiology and arrhythmias.

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ARE HEMATOLOGIC INDECES USEFUL IN IDENTIFYING CULTURE NEGATIVE SEPSIS AND GUIDING ANTIBIOTIC THERAPY IN WELL APPEARING LATE PRETERM AND TERM NEONATES?

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Background: Sepsis in the newborn period primarily occurs in the setting of clinical or histological chorioamnionitis, both of which are associated with abnormalities in hematological indices. A small group of infants however, in absence of chorioamnionitis are admitted to the NICU with a diagnosis of presumed sepsis due to abnormal lab values on the screening CBC done in the newborn nursery. These infants are then exposed to antibiotics for a 48 or greater hour period based on the clinician’s discretion. This study is to evaluate the association between abnormal hematologic indices such as WBC, IT ratio, CRP and degenerative neutrophils and its relationship to true placental inflammation in well appearing late preterm to term infants with negative cultures; In addition to determining the need for antibiotics beyond 48 hours.

Design/Methods: Retrospective Cohort study on infants born > 35 weeks GA near term and late term infants admitted to the NICU who received a sepsis evaluation and at least 48 hours of antibiotics. Many infants were initially admitted to newborn nursery and had a screening CBC or were well appearing at birth None. of whose mothers had fever.

Results: Of the 100 infants in our study 70 had placental pathology available and only 22% (16 infants) were found to have histological evidence of fetal placental inflammation, also called funisitis. For these infants the IT ratios,12 and 24 hour CRP were elevated showing statistical significance and a negative predictive value of 76%,75%and 76% respectively. The data showed that the negative predictive value for degenerative neutrophils and WBC were at 93% and 84% respectively. Of the infants that received antibiotics, only 17% of those in the >2 days group and 14% in the <=2 days group showed funisitis and all had significant CRP and/or IT ratios.

Conclusion: Per our Cohort appears that IT ratio and 12 and 24 hour CRPs showed a statistical significance in patients with evidence of placental inflammation. In a hand full of patients it appears that an elevated CRP or IT ratio would be more concerning for true infection while those with elevation is only WBC or with evidence of degenerative neutrophils might not be correlated with true infection. Future large center may be helpful in managing culture negative sepsis, as this could decrease hospitalization costs, risks for hospital acquired infections and could potentially decrease the use of unnecessary antibiotic therapy.

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