ACP NATIONAL ABSTRACTS COMPETITIONS
EARLY CAREER PHYSICIANS
2019

EARLY CAREER RESEARCH PODIUM PRESENTATIONS

KANSAS RESEARCH PODIUM PRESENTATION - Khaldoun Haj Mahmoud, MD

NARCOTICS USAGE PATTERNS IN THE INPATIENT SETTING - IDENTIFYING WAYS TO IMPROVE PATIENT SAFETY

Authors: Khaldoun Haj Mahmoud; Ahmad G Tarakji; Chris Groutas; Eyad Reda; Rafia Rasu; Jaehoon Lee; Cheryl Gibson

Introduction: Hospital inpatients frequently require opioid analgesics for pain management, with more than half of patients in acute-care facilities receiving opioids during their stay. With the rise of opioid drug therapy and the rising mortality from these medications, the need to identify prescription patterns has become urgent. This study aims to determine the prevalence of type of opioid used on internal medicine admissions, and to discern patterns of inpatient opioid use.

Methods: Data were pulled from the medical center's centralized data repository. Adult patients who were administered any opioid analgesic therapy during their inpatient stay between January 2015 and December 2017 were included in the analyses. Dosages of opioids administered were obtained and standardized by converting to the oral morphine equivalent (OME). Mean cumulative daily dose of opioids was calculated for each admission. A bivariate analysis was conducted to identify variables that have a significant association with opioid analgesic therapy for inclusion in a subsequent multivariable analysis. Stepwise regression using Bayesian Information Criterion and forward-backward selection method was used.

Results: The sample included 614 patients comprising 716 admissions. Patient age was 56 ± 18 years with 57% female. Mean stay was 3.5 days. The most frequently administered opioids were oxycodone and fentanyl. 13% of inpatients received 2 doses of IV opioid medications in the last 24 hours of the inpatient stay. When plotting opioid usage patterns, the mean opioid dose for each patient remained relatively consistent regardless of length of admission; however, frequency of opioid administrations decreased throughout the patient stay. Variables associated with opioid therapy were history of diabetes (DM), diabetes complications (DMcx), drug abuse, psychoses, and length of stay. DM and DMcx have a significant effect on opioid daily use. Drugs, history of psychoses, and LOS have a positive effect on opioid daily use. These 5 predictor variables explained 14% of the variance of opioid daily use.

Conclusion: This study provides insight into opioid prescribing patterns for inpatients and the need to set appropriate protocols for pain relief practices. Nearly 1 in 8 patients received IV opioid medications within 24 hours of discharge. Fentanyl and oxycodone were the primary choices for inpatient pain treatment. Because of their potency and potential for addiction, alternative pain management therapies need to be explored. This study suggests high utilizers of opioid therapy can be characterized as those who have longer periods of inpatient stays and a history of diabetes, psychoses, or drug abuse. However, a substantial degree of unexplained variance in the best fit model suggests that other factors are in play. Nevertheless, these findings can inform efforts to improve the safety and efficacy of inpatient opioid prescribing.

KENTUCKY RESEARCH PODIUM PRESENTATION - Prerna Dogra, MD, FACP

CHOOSING WISELY: "INPATIENT THYROID FUNCTION TESTING – ARE WE ORDERING INAPPROPRIATELY?"

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Introduction: In the US, thyroid stimulating hormone (TSH) is the 4th most commonly ordered laboratory test. In 2016, Medicare alone spent $482 million on TSH testing.1 The objectives of this study were to analyze (a) the clinical utility and cost-effectiveness of inpatient TSH testing2,3 (b) the pattern of thyroid function tests (TFTs) ordered.4

Methods: This is a single-centered retrospective study done on patients admitted to Medicine, Neurology and Psychiatry services at a tertiary care center between October 26,2015 to October 25,2018. Exclusion criteria were age <18 years and prior thyroid-related disorders. Based on TSH results, in relation to normal reference range, admissions were grouped as – normal and abnormal. Records of patients in abnormal group were extracted for chart review. Abnormal group was then divided into 2 sub-groups based on positive and negative outcomes. Positive outcomes were defined when a correct diagnosis of overt or subclinical hypo/hyperthyroidism was made and (i) inpatient treatment was started and/or (ii) an appropriate endocrinology referral was made. Negative outcomes were defined when (i) subclinical hypo/hyperthyroidism was diagnosed and no intervention was done or (ii) euthyroid sick syndrome was diagnosed or (iii) lack of above mentioned positive outcomes.

We also calculated the number of bundled TFTs (bTFTs), defined as TSH testing done simultaneously with free-thyroxine (fT4), total T3 (T3) or free T3 (fT3) tests. Patients with a prior abnormal TSH test in the same admission were excluded.

Results: Total of 24,243 TSH tests were sent on 22,123 admissions(n) to selected services. Of these 17,629 (72.72%) tests were ordered in admissions with no history of thyroid disorder (n = 16,130). 13,093 and 3,037 admissions were flagged normal and abnormal, respectively (81.17% vs 18.83%). Total 214 (1.21%) tests resulted in a positive outcome (n=152; 0.94%). Total 188 (3.64%) of 5170 fT4 resulted in positive outcome. Over the 3-year period of study, of the 152 admissions with positive outcome, only 55 had received a right diagnosis of overt hypo/hyperthyroidism. Based on current National Limitation Amount, $139,174/year worth of thyroid-function tests (TFTs) were ordered at a single center resulting in no positive outcome.

Total 4,103 bTFTs (23.27% of total TSH tests) were sent as screening test for thyroid disorder over the same period.

Conclusion: Inpatient TSH testing provides a low yield of true-positive results. Often the abnormal test results are difficult to interpret due to acute illness and are often ignored by ordering provider or risk misdiagnosis and unnecessary consults. In addition to its low clinical utility, improper ordering of inpatient thyroid-function tests (TFTs) add to laboratory overutilization and to the rising health-care costs.5

TSH alone is the recommended screening test for detecting abnormal thyroid function. A significant proportion continue to be ordered as a combination panel suggesting the need for more education and awareness.4

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NEW YORK RESEARCH PODIUM PRESENTATION - Ankita Sagar, MD, MPH, FACP

Curbing our enthusiasm for opioid prescribing: dashboarding, inter-disciplinary, and hot-spotting our way to judicious opioid prescribing for chronic pain

Authors: Ankita Sagar, MD, MPH1, Joanne Gottridge, MD1, Henry C. Bodenheimer, Jr. MD1, 1Donald and Barbara Zucker School of Medicine at Hosfstra/Northwell Health - Department of Medicine

Introduction: Opioid use disorder effects approximately 2 million people across US and costs approximately $78.5 billion.1-2 The role of prescription opioids in this crisis is evident as 70% of all prescription drug overdoses are attributed to prescription opioids.3-4 In 2012, providers wrote 259 million opioid prescriptions, approximately one prescription per capita; New York State's ratio was 52-71 prescriptions per 100 residents.5 Similarly, a sentinel event at a primary care practice sparked this study, in order to improve patient safety, authors pursued a quality improvement study for judicious opioid prescribing for chronic pain.

Methods: Primary care providers' prescribing patterns were analyzed via electronic medical record (EMR) derived opioid prescription dashboard. Subsequently, data were shared with providers and clinical leaders. Opioid prescribing guidelines were shared with all members of practice sites, and clinical leaders discussed these during quarterly meetings.

Using above dashboard, prescribing volume per provider per month was calculated. Outlier providers were identified and authors conducted a focused evaluation of the providers' charts to determine compliance with guidelines. If concerns about a provider's prescribing remained, further interventions included:

Provider specific: providers repeated New York State Online Opioid course, underwent training for naloxone administration and utilizing Opioid Risk Tool, granted access to CDC video on Opioid risks and benefits6.

*Interdisciplinary team specif*ic: nurses served as Screening, Brief Intervention, and Referral to Treatment (SBIRT) coaches, trained for naloxone administration, and utilized Prescription Monitoring Program (PMP). Medical assistants were trained to access PMP. Practice managers ensured guidelines were accessible and staff remained empowered.

Community/site specific: site-specific list of community and health system resources was created. Community based organizations were identified for cognitive behavioral therapy. Physical therapy and Pain Management practitioners were identified for co-management of chronic pain.

Transparent feedback was regularly discussed between authors and each practice site. Meetings included the inter-professional team. Each provider was given most recent prescribing data and focused professional evaluation. Barriers to judicious opioid prescribing and next steps were identified for the following practice meeting.

Results: Pre-intervention period consisted of 6 months prior to the start of the study. Post-intervention period consisted of 6 months after the intervention. Results displayed in Table 1.

Table 1: Opioid & Naloxone Prescribing for Chronic Pain by Primary Care Providers

Outcome Measure	Pre-Intervention	Post-Intervention	Change

Outcome Measure	Pre-Intervention	Post-Intervention	Change
Number of Opioid Prescriptions	1,082	750	Reduction of 30.68%
Number of Patients Receiving Opioid Prescriptions	515	382	Reduction of 25.82%
Number of Naloxone Prescriptions	49	108	Increase of 220%

Conclusion: Combination of dashboarding, inter-disciplinary teamwork, and hot-spotting is an effective method to promote judicious opioid prescribing for chronic pain. Future studies plan to address referrals for co-management of chronic pain, morphine milligram equivalents (MME) per patient per month, and rate of opioid prescription per encounter.

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EARLY CAREER RESEARCH POSTER FINALISTS

ARIZONA RESEARCH POSTER FINALIST - Kenneth Poole Jr, MD, FACP

Patient Attitudes Regarding Team-based Care

Authors: Kenneth Poole M.D., Gretchen Taylor M.D., Ralph Davis M.D., Marlene Girardo MS

Introduction: Outpatient practices are evolving into nontraditional models of care in an effort to maximize patient volume and improve efficiency. This has led to team-based models that have expanded roles for mid-level providers as well as integrated technology into the practice such as the capability of virtual visits. As patients now receive direct care, as well as information regarding their care, from multiple sources and providers, we wished to study patient's preferences when receiving their care and the role of the provider-patient relationships.

Methods: A 13-question survey was distributed to all patients in the outpatient internal medicine clinic of Mayo Clinic Arizona over a 6-week period. Four discrete choice experiment questions were used to assess patients' preferences when accessing care delivered by multiple types of providers, in different care delivery settings and with varying schedule flexibility. Initial analysis was with a sample size of 800 out of 1731 eligible patients with P-values less than 0.05 being considered significant. Descriptive statistics and chi-squared tests were used for categorical variables. A Mann-Whitney rank-sum test was used for continuous variables.

Results: Regarding annual exams, 84.5% of patients younger than 65 preferred seeing their regular provider while 90.6% of those older than 65 felt the same (p=0.0049). The percentage of patients preferring their regular provider for exams increased with age when age groups were delineated (p=0.0003). As for acute visits, 41.7% preferred their regular provider while 41.4% preferred an appointment when they wanted it (p=0.9203). Regarding virtual visits, 71.7% aged 65 years and older preferred face-to-face visits, while 53.4% aged younger than 65 preferred the same (p=<0.0001). When communicating with nurses and medical assistants, 32.5% preferred the same person while 48.4% preferred a quick response (p=0.0409). Differences in patient preferences were seen in those with different annual incomes. 55.4% of those with annual household incomes greater than $100,000 were interested in prompt replies rather than speaking with the same person, while 37.5% of those with annual earnings under $100,000 preferred the same (p=0.0004). 28.6% of those with annual household incomes greater than $250,000 would prefer a prompt virtual visit as opposed to face-to-face visits(p=0.0005), while 12.8% of those earning less than $100,000 annually said they would choose the same (p=0.0026).

Conclusion: The study shows the doctor-patient relationship is still highly valued, and its value increases with age. Virtual visits are a possible avenue for care delivery, but not all patients prefer them. Furthermore, survey questions posed as a discrete choice experiment allow for an assessment of patient values and trade-offs when accessing care.

CALIFORNIA RESEARCH POSTER FINALIST - Stephanie Conner, MD

The POCUS Supervision Safety Gap: Attending Physician Knowledge in Point-of-Care Ultrasound Lags Behind That of Internal Medicine Residents

Authors: Stephanie Conner, MD; James Anstey, MD; Meghan O'Brien, MD, MBE; Farhan Lalani, MD; Trevor Jensen, MD, MS

Introduction: Point-of-Care-Ultrasound (POCUS) is increasingly recognized as a useful diagnostic tool in hospital medicine. US-based resident physicians are being trained in the use of POCUS, but education for hospitalist attendings has lagged behind, creating a potential safety gap in supervision. We developed a test assessing knowledge of routine POCUS applications in hospital medicine and compared attending and resident physician performance at a single academic teaching hospital.

Methods: Experienced POCUS faculty developed a 15 item test designed to assess the application of POCUS in hospital medical practice. The test focused on four domains of use: basic knowledge, image interpretation, clinical integration, and understanding of limitations. Questions were developed to address common use-cases for POCUS and be completed in <10 minutes. An invitation to complete the test was sent by email to all internal medicine residents (n= 180) and all hospital medicine attendings (n=97). Each question included a "Not sure" answer choice and respondents were instructed to not guess. Test results (% correct) were compared for attendings and residents using unpaired t-tests and analysis of variance.

Results: 58 residents (32% response rate) and 41 (41%) attendings completed the test. The mean resident score was 55.6% (49.8–61.3 95% CI) and mean faculty score was 45.3% (27.9–54.1 95% CI) with a mean difference of 10.3% (0.32–20.3 95% CI, p=0.022). Faculty performed significantly worse than resident physicians in the domains of knowledge, image interpretation, and understanding of limitations (Table 1). Additionally, test performance was found to be inversely related to years of attending experience (p<0.001, ANOVA, Table 2).

Table 1. Comparison of POCUS knowledge assessment scores between residents and faculty.

Residents (% correct, 95% CI)	Faculty (% correct, 95% CI)	p-value	
Total Score	55.6 (49.8–61.3)	45.3 (27.9–54.1)	0.0216
Knowledge	79.3 (72.3-86.3)	57.3 (38.0-45.3)	0.0005
Image Interpretation	51.1 (44.9-57.3)	40.2 (30.8-49.7)	0.0234
Clinical Integration	44.8 (35.9-53.8)	37.4 (26.3-48.5)	0.1465
Limitations	73.3 (65.0-81.5)	61.0 (50.1-71.9)	0.034

Table 2. Average POCUS knowledge assessment scores by level of clinical experience (p = 0.0002, ANOVA).

Level of Training	% Correct (95% CI)
Intern	45.5 (37.7-53.3)
Senior Resident	61.7 (54.5-69.0)
Faculty (0-3 years)	59.3 (42.2-76.3)
Faculty (4-6 years)	51.6 (38.8-64.4)
Faculty (7-10 years)	33.3 (14.7-52.0)

Faculty (>10 years)	23.6 (10.1-37.0)

Conclusion: Our survey revealed that while both residents and faculty have POCUS knowledge limitations, faculty have a significantly lower baseline knowledge than the residents they supervise. Specifically, residents outperformed faculty in the domains of basic principles, image interpretation and most importantly, knowledge of limitations. This represents a supervision safety gap and was more pronounced among more senior hospitalists, likely reflecting the recent wave of POCUS training in residency programs for junior faculty. As POCUS proliferates in residency training, this data argues for a comprehensive faculty curriculum with emphasis on supervision, knowledge of limitations, and appropriate practice in hospital medicine.

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CONNECTICUT RESEARCH POSTER FINALIST - Marilyn Katz, MD, FACP

Aligning Opioid Prescribing Practices at an Academic Health Center

Authors: Marilyn Katz, MD, Assistant Professor of Medicine, Core Faculty, UConn Categorical Internal Medicine Residency Program; Rebecca Andrews, MD, Associate Professor of Medicine, Associate Program Director, UConn Categorical Internal Medicine Residency Program; Helena Hilario, Quality Improvement Advisor, UConn Health; Kevin Chamberlin, PharmD, Associate Clinical Professor of Pharmacy Practice, UConn School of Pharmacy; Jillian Barrack, PharmD, Pharmacy Resident, UConn Health

Introduction: The opioid epidemic is not news to practicing physicians; however, implementing change on the individual, practice, and health-system levels can be challenging. Barriers include individual prescribing practices, specialty, data access, clinical support, state statutes, and access to alternative pain treatment modalities.

Methods: Baseline data was collected regarding the number of patients on chronic opioids.

At the University of Connecticut we convened an Opioid Task Force (OTF) composed of key stakeholders to assess current and best practices. Medication agreements and successful processes from a primary care resident-based clinic formed the base of a new medication agreement. A chronic opioid protocol and opioid policy were developed to mirror the CDC guidelines and Connecticut law with feedback from interdisciplinary stakeholders. An Opioid Tool Kit (OTK) was designed reflecting best practice and included quick references for both providers and patients.

Education and materials were distributed to prescribers via multiple routes including department meetings, grand rounds, the medical staff meeting, and email.

Follow-up data reviewed on a quarterly basis.

Results: A baseline data extraction identified 921 patients on chronic opioids. After chart review, 517 were accepted into the study. Of these, 63.2% did not have a medication agreement, 76% did not have a recent urinary toxicology (of those that did, only 29% were ordered correctly), 80.9% did not have documentation of review of the state opioid prescribing database and 6% had their last pain visit over 1 year ago. Initial results consisted of unsuspected barriers to change and the development of the OTK to assist prescribers. The OTK contained a new medication agreement that focused on functional goal, non-opioid pharmacotherapy and non-pharmacological suggestions, a risk assessment tool, and additional resources for both patients and prescribers.

Follow-up data extractions are scheduled for mid-December and mid-February to assess for improvement in the baseline metrics and will be ready for presentation in April.

Conclusion: A resident clinic pilot success can serve as a springboard for institutional change. A multi-pronged approach (educational, guideline driven policy and procedure, simplified documents, easy to access support materials) can lead to institution-wide change.

Institutional change involves expected barriers including how to best disseminate information, developing specialty specific information, and administration support for burdens on primary care. Sustained change can also be challenged by systems (an EMR change between the baseline and follow-up data), quality of extracted

data, individual prescriber behavior, and non-standard clinical documentation. Our educational approach was designed to address these factors.

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DISTRICT OF COLUMBIA RESEARCH POSTER FINALIST - Sarah Kattakuzhy, MD

Collocated Buprenorphine with HCV Treatment Results In High Rates of OAT Uptake and Retention and Lowered Rates of Overdose and Risk Behaviors in People Who Inject Drugs: Data from the ANCHOR Study

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Introduction: People who inject drugs **(**PWID) with opioid use disorder (OUD) and HCV have significant morbidity and mortality, not only from HCV-related outcomes, but from harms associated with OUD and injecting drug use (IDU), including overdose death. Opioid agonist therapy (OAT) has been demonstrated to improve outcomes, but access and uptake remain low amongst active PWID.

Methods: ANCHOR is a single-center study evaluating treatment of HCV in PWID with chronic HCV, OUD, and IDU within 3 months. Participants received sofosbuvir/velpatasvir for 12 weeks, and those not on OAT were offered collocated buprenorphine. The Darke HIV Risk Taking Behavior Scale (HRBS) and an overdose questionnaire were completed at several visits.

Results: Of 100 enrolled patients, 76% were male, 93% were black, with median age of 57 years; 58% injected opioids daily or more at baseline. Sixty-seven (67%) participants were not on baseline OAT, and 49 (73%) initiated collocated buprenorphine. Of these, 35 (72%) were retained on buprenorphine at 6 months.

At baseline, 91% of individuals reported witnessing an overdose, and 65% reported experiencing an overdose. During the study period, 45 (48%) subjects witnessed an overdose, and 12 individuals personally experienced a total of 13 overdoses. To date, there have been 4 confirmed opioid overdose deaths, a risk of 4.9 per 100 person-years follow up. Patients who were on OAT at the six-month timepoint had a decreased likelihood of overdose ($p=0.03$) compared to those not on OAT. Those who initiated collocated buprenorphine had a significant decline in IDU-associated risk by HRBS ($p=0.0001$) after six months, not seen in those on baseline OAT or those not on OAT.

Conclusion: Data from the ANCHOR study demonstrate that PWID with HCV are a high-risk population who experience frequent opioid overdose and overdose death. However, high rates of uptake of and retention in OAT during HCV treatment were associated with a decline in IDU risk behavior and likelihood of overdose. These data support that HCV treatment can serve as a platform to engage PWID with ongoing IDU in treatment for OUD. Collocation of OAT with other medical therapy is a critical way for internists to reduce harms and improve the morbidity and mortality of this marginalized population.

JAPAN RESEARCH POSTER FINALIST - Osamu Hamada, MD

Impact of the hospitalist system in Japan on quality of care and healthcare economics

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Introduction: The hospitalist system is considered successful in improvement in quality of care and cost effectiveness; previous studies have consistently demonstrated clinical efficiency in the United States. Since its recent introduction in Japan, there have been high expectations for the impact of the hospital system, but its efficacy there has not yet been examined. Japanese medical care is characterized by specialization and fragmentation of care. Japanese physicians are reportedly showing high levels of specialty in their respective fields. There is increased concern, however, about the capability of each specialist in comprehensive and effective management of patients with multiple comorbidities. As Japan is facing the challenge of being a “super-aged society”, many elderly patients with one or more complex chronic diseases may require continuous, proactive and tailored care. Consequently, the Japanese medical system faces the challenge of coping with the complex demands of the “super-aged society” it serves. This study investigates the impact of a hospitalist system on quality of care and healthcare economics among a Japanese population.

Methods: We analyzed 274 patients 65 years of age or older whose most resource-consuming diagnosis on admission was aspiration pneumonia. We stratified patients as those managed by hospitalist service compared with those patients managed by other departments (control group). The outcomes of this study were healthcare economics (length of stay and hospital costs) and quality of care (duration of antibiotics therapy, rate of change to oral antibiotics, number of chest X-rays, and number of lab tests). We also analyzed mortality rate and readmission within one month. Propensity score matching was used to minimize selection biases.

Results: In matched pairs, length of stay in the hospitalist group was shorter than of the control group. Care by the hospitalist system was also associated with significantly lower hospital costs and shorter duration of antibiotics therapy. The number of chest X-rays and lab tests were also consistently lower in the hospitalist group than in the conventionally treated group. There was no statistically significant difference in mortality rate or readmission rate between the groups.

Conclusion: Our observational study shows that the hospitalist system could improve on conventional care in healthcare economics and quality of care. There is indication that the hospital system could be successfully implemented in Japan.

MAINE RESEARCH POSTER FINALIST - Rattanaporn Mahatanan, MD

Application of Pulmonary Embolism Rule-out Criteria and Age-Adjusted D-Dimer in Patients with Suspected Pulmonary Embolism: A Community Hospital Study

Authors: Rattanaporn Mahatanan, MD, Brianna Philbrick, MS3, William Hirschfeld, MS3, Gina Gomez, MD

Introduction: The incidence of pulmonary embolism (PE) doubled in the 1990s after the introduction of D-dimer testing and computed tomographic pulmonary angiography (CTA). Well validated algorithms have been utilizing to reduce the overuse of CTA; however, the problem remains. PERC criteria and age-adjusted D-dimer in patients aged 50 years or older are the alternative strategies to reduce the unnecessary CTA1-2 . We aim to evaluate the value of using PERC and age-adjusted D-dimer to reduce the utilization of CTA in suspected pulmonary embolism.

Methods: A retrospective medical chart review was performed for all patients who underwent D-dimer testing and chest CTA for clinical suspicion of pulmonary embolism (PE). The baseline characteristics, clinical presentations and laboratory data were collected. Patients were divided into 3 categories of probability according to their Wells scores. The algorithms from the American College of Physicians (ACP) were used to determine the next step of management, including calculating Pulmonary Embolism Rule-Out Criteria (PERC) and measurement of D-dimer if indicated per algorithms3. Age-adjusted D-dimer, defined as age x 10 ng/mL, was calculated in patient age 50 years or older. We hypothesize the scenario when applying the new cut-off point of D-dimer and PERC criteria to our cohort.

Results: A total of 414 patients were included in our study. Fifty-seven percent of patients were female. Mean age was 51 years (SD=19.17). Shortness of breath and chest pain were the common presentation (81%). A total 168 CTAs were performed and found that 11 patients (11/414;15%) had pulmonary embolism. A total of 350 patients (350/414;84%) had D-dimer done, 127 (36%) found to have positive result with a normal cut-off (<50 ng/mL) and 5 (5/127;4%) of positive D-dimer patients had PE. If we had applied the hypothetical scenario with new cut-off for positive D-dimer, 22 patients (22/127;17%) would have had negative results (ARR 0.09, 95%CI 0.05-0.12) and 12 patients (12/168;7%) would have not needed CTAs (ARR 0.07, 95%CI 0.01-0.11). If PERC criteria had been applied in our study, 100 (29%) patients of 347 patients in low risk group would have not had D-dimer testing (ARR 0.61, 95%CI 0.55-0.69) and 21 patients (21/168; 13%) would have not required CTAs (ARR 0.08, 95%CI 0.05-0.11). Overall, our study found that a total of 32 patients (19% of a total CTA), could have been avoided the imaging by applying PERC criteria and age-adjusted D-dimer (ARR 0.12, 95%CI 0.08-0.15). There would have been no missing diagnosis of PE in our study even if these two strategies had applied.

Conclusion: In our study, implementation of PERC criteria in low probability group and applying age-adjusted D-dimer in patient with suspected pulmonary embolism would have significantly reduced the unnecessary of D-dimer testing (29%) and the CTA (19%) without missing the diagnosis of PE.

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MICHIGAN RESEARCH POSTER FINALIST - Jawad Al-Khafaji, MD

Midnight Report: A Novel Faculty-Led Night Curriculum to Enhance Residents Nighttime Education

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Introduction: While there are ample opportunities for resident's education during the daytime, such opportunities are scarce during the night. While literature shows that few educational interventions have been implemented in some academic hospitals, these interventions where either residents-led with unclear sustainability considering no faculty supervision1,2; or nocturnists-led, focusing on clinical supervision and teaching, but without structured curriculum3,4. Presently, there's a general lack of structured curriculums, negative perception of nighttime education by residents, and desire to enhance nighttime education by both residents and faculty5,6,7.

Methods: The internal medicine night rotation in Virginia Commonwealth University is comprised of two teams. Each team has a senior resident and two interns. The two teams cover eight patients' services (five general medicine services, and hematology, oncology, and GI/liver). Residents are supervised by academic nocturnists who oversee the residents in patient-care handoffs, assist in the management of patients who are admitted to the above-mentioned services, and do clinical teaching. To enhance education during the night rotation, midnight report was established in early 2016. The report is held twice weekly on Wednesdays and Fridays at midnight. The report is a 30-45-minute session, involves all residents, led by academic nocturnists and is structured to mirror morning report. The session includes clinical presentation by residents of a patient admitted early in the week, with evidence-based teaching focus on either differential, diagnostic work-up, or management. Residents' (PGY1, PGY2, and PGY3) perception of the different educational values of the midnight report were surveyed for the period 7/2016 - 6/2017. The survey included 8 questions, and these can be answered in the following grades- Very negative, negative, neutral, positive or Very positive effect. A Likert scale was used for the surveys.

Results: A total of 128 residents of all levels of training participated in the survey. 65 % of the residents perceived the educational values of midnight report positively and 28% being neutral. 73 % of the residents valued the teacher-learner relationship between residents and academic nocturnists, besides evidence-based learning, and overall teaching environment at the hospital. Residents, however, still perceived insufficient continuity of education across day and night shifts, as expected considering the abundance of teaching conferences during the daytime, compared to nighttime. There was no significant difference in perception based on the PGY level.

Conclusion: The midnight report, led by dedicated academic nocturnists and designed to mirror daytime morning report, was implemented to enhance nighttime educational value at our hospital. The educational values of the curriculum were perceived positively by our residents. The midnight report can be an educational model for other hospitals and institutions, to enhance continuity of residents education across day and night time.

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MICHIGAN RESEARCH POSTER FINALIST - Matthew Sczepanski, DO

Identifying Areas for Improvement in Lung Cancer Screening

Authors: Matthew Sczepanski, DO; Daniel Keena, MD; Paul Christensen, MD

Introduction: Lung cancer is the leading cause of cancer death in men and women and smoking cigarettes is the main risk for development of the disease. Early detection can decrease mortality. The Centers for Medicare and Medicaid Services recommend screening for lung cancer with an annual low-dose CT scan of the chest in patients 55-77 years-old with a 30 or more pack-year smoking history who are either current smokers or who have quit within the past fifteen years. The majority of patients undergo screening through their primary care providers. Shared decision making and selecting the appropriate patient are two crucial factors necessary when deciding who to screen.

Methods: We created an informational video about shared decision making for lung cancer screening. The video was targeted to patients and highlighted the risks and benefits of screening. Prior to releasing the video, we sought to obtain provider opinion via a short survey. The protocol was reviewed and approved by the institutional review board. An email was sent to health care providers in primary care, oncology, pulmonology, and thoracic surgery at Beaumont Health – Royal Oak, MI requesting their participation. After consenting to the study, participants completed a short electronic survey. Participants were asked about specialty, years in practice, and whether they currently used informational videos to educate patients. Three questions tested the provider's knowledge on the appropriate patient criteria for lung cancer screening (age range, smoking status, and pack-years smoking). Participants were then shown the video and asked if it would be helpful in their practice.

Results: Eighteen providers responded (14 primary care, 2 pulmonology, 1 palliative care, 1 radiation-oncology) with years in practice ranging from one to 45 years. Six participants already used educational videos in their practice. Four providers correctly identified the appropriate age (2 primary care, 2 pulmonology), six correctly identified the appropriate pack year history (4 primary care, 2 pulmonology), and thirteen correctly identified the appropriate smoking status (10 primary care, 2 pulmonology, 1 radiation-oncology). Two providers correctly answered all three components, both were pulmonologists. Twelve of the participants believed the video would be useful in their practice.

Conclusion: Only two providers were able to correctly answer all three components required in selecting the appropriate patient for lung cancer screening. This demonstrates a gap in knowledge particularly in those who are the primary providers of preventative care. While many primary care providers can easily identify the appropriate patient to screen for breast, prostate, cervical, and colorectal cancer, lung cancer screening remains an area that needs more physician education. Educational videos may prove to be educational for both the patient and the provider and allow for improved quality in healthcare.

NEBRASKA RESEARCH POSTER FINALIST - Christopher Smith, MD, FACP

"It makes me respect what they do a whole lot more." Evaluation of how interprofessional point-of-care ultrasound education impacts participants' perceptions of interprofessional learning and stereotypes

Authors: Christopher J. Smith, Kimberly K Michael, Elizabeth L. Beam, Kathryn Wampler, Devin Nickol, Lea Pounds, Kristy Carlson, Tabatha Matthias

Introduction: As point-of-care ultrasound (POCUS) education becomes more common in medical education, many programs struggle with a shortage of POCUS-trained faculty.1,2 Interprofessional education (IPE) in which "students from two or more professions learn about, from and with each other," may offer a solution by expanding the number of available teachers and leveraging expertise from other professions. Prior studies have found that IPE is valued by learners3 and mitigates biases towards other health professions,4 but medical trainees have less positive attitudes 5,6 than other professions. The purpose of this study was to evaluate the impact of an IPE POCUS workshop on participants' perceptions towards interprofessional education, collaboration, and stereotypes.

Methods: The study took place at a Midwestern academic health sciences university. Students in the Diagnostic Medical Sonography (DMS) program (n=6) served as coaches for first-year internal medicine (IM) residents (n=24). Residents had received prior training in cardiopulmonary POCUS, but not abdominal scanning. Prior to the workshops, DMS students participated in a 2-hour train-the-trainer session in which they learned teaching strategies via case-based simulation with peer and faculty feedback.

In the POCUS workshops, DMS students coached IM residents to acquire images of the kidneys, bladder, and gallbladder. The course utilized a flipped-classroom approach to maximize scanning time. Residents scanned live models at 4 stations, each lasting 30 minutes and facilitated by a different DMS coach.

Assessment: Participants completed pre/post online surveys and participated in post-intervention interviews. The 24-item survey was adapted from validated instruments for assessing intprofessinoal attitudes.7-9 Paired survey results were analyzed via Wilcoxon signed-rank test. DMS students and IM residents participated in semi-structured focus group interviews, which were recorded and trascibed for analysis. Two coders reviewed interview data using a qualitative descriptive approach10 to generate major themes, which were validated by member checking.

Results: Twenty-four of 24 (100%) IM residents completed the pre- and post-intervention surveys. There was statistically significant improvement ($p<.05$) for 8 of 14 questions addressing perceptions towards IPE and 9 of 10 questions regarding interprofessinoal stereotypes/biases.

Twenty three of 24 residents (96%) and 6/6 DMS students (100%) participated in focus group interviews. IM residents felt the IPE workshop provided a more relaxed learning environment than traditional training sessions and DMS students felt the experience encouraged deliberate consideration of their scanning technique, which could improve future performance. Working together led both groups to better appreciate the other's profession. IM residents had misconceptions corrected and gained new respect for the DMS coaches. Residents also expressed interest in seeking additional IPE opportunities not related to POCUS, including with nursing and physical therapy.

Conclusion: This study found that interprofessional POCUS education can improve participants' perceptions towards interprofessional education, dispel stereotypes amongst health professionals, and motivate interest in future interprofessional collaboration.

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NETHERLANDS RESEARCH POSTER FINALIST - Tiffany I Leung, MD, MPH, FACP

A Scoping Literature Review of Physician Suicide

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Introduction: Physician suicide is a global issue with significant consequences for workforce sustainability and for public health (1). Since a 1886 obituary in *The New York Times* remembered a physician who died by suicide, more physicians and trainees tragically continue to die by suicide or experience suicide attempts, thoughts or ideation. This suggests that knowledge and implementation gaps towards suicide prevention persist. A literature review would enable community learning towards preventing physician suicidal behaviors. The aim of this scoping review was to map the landscape of published research and perspectives on physician suicide.

Methods: For this scoping review (2,3), we searched Ovid MEDLINE, PsycInfo, and Scopus for English-language journal publications from August 21, 2017 through April 28, 2018. Inclusion criteria were a primary outcome or thesis focused on suicide (including suicide completion, attempts, and thoughts or ideation) among medical students, residents, or practicing physicians. Opinion articles were included. Exclusion criteria were studies of only physician burnout, mental health or substance abuse disorders. The iterative search methodology resulted in 1,596 citations; 348 citations passed to the full-text review round. Data extraction was performed and topic annotations were applied to citations. Annotations were then condensed into a core set of themes and visualized in a thematic map, or network graph, weighted by frequency of co-occurrence.

Results: The earliest publication is an editorial from 1903; 210 (60.3%) articles were published from 2000 to present. Overall, 142 (40.8%) were opinion articles. Of the remaining 206, 84 were cross-sectional studies, the most common study design. Only 13 articles described interventions; 5 of them described implementing the American Foundation for Suicide Prevention's Interactive Screening Program (3 of 5 originate from one institution), and 1 of 13 was a randomized controlled trial of a web-based intervention. Authors originated from 37 countries. Also, unexpected subpopulations were described, including immigrant physicians, physician pilots, and physicians who experienced war either as victims (e.g. Holocaust survivors who were physicians) or as wartime medics. One investigator studied the interpersonal psychological theory of suicidal behavior in physicians, which posits three necessary and sufficient precursors to death by suicide: (1) thwarted belongingness, (2) perceived burdensomeness, and (3) acquired capability. Two themes, mental health and risk factors, co-occurred most frequently and in 206 (59.2%) of all articles. Additional risk factors for suicidal behaviors discussed, with variable generalizability, included: burnout, stress, substance misuse, knowledge of and access to lethal means of self-harm, ongoing litigation at time of death, role strain, financial burdens, personality traits, and adverse childhood experiences or familial relationships.

Conclusion: The majority of publications on physician suicide have been published in the last two decades, a promising sign of growing knowledge of the subject. Results confirm the global nature of physician suicide. However, few interventions for physician suicide prevention exist. Findings can inform further learning, research, and advocacy towards physician suicide prevention.

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NEW JERSEY RESEARCH POSTER FINALIST - Jose Bustillo, DO

Improving the Compliance to The Joint Commission Discharge Summary Requirements and Reduction of 30-day Medicine Readmission Rate

Authors: Bustillo, Jose DO, Feinberg, Monica, RN, Mattoon, Amelia RHIA MAS, Al Obaidi, Nawar MD

Introduction: Hospital discharge summaries serve as the primary documents communicating a patient's care plan to the post-hospital care team. High-quality discharge summaries to include The Joint Commission (TJC) required components are essential toward promoting patient safety during care transitions and potential reduction in 30-day readmission rates. A study was conducted to examine the presence of the discharge summary in the electronic medical record, the completeness according to The Joint Commission required components, and the impact on 30-day Medicine readmission rates. The objective of this project is to improve compliance with a standardized discharge summary to include TJC standardized components, and reduce 30-day Medicine readmission rates through provider education.

Methods: Data was obtained between June – September 2018 through randomly-selected retrospective chart review including only adult, Medicine admissions. The pre-intervention data was reviewed for a) the completion of the discharge summary and b) the compliance to all of The Joint Commission discharge components. Intervention included a discharge summary fact sheet distributed to all providers and communicated through medical staff meetings outlining the rationale for the discharge summary, its importance in patient safety and efficiency, required components, and instructions with how to access it in the electronic medical record. Education continued with the identified top non-compliant providers on a one-on-one basis with the hospital's chief physician clinical officer. Post intervention data was collected test effectiveness of the education on compliance, and the impact on Medicine 30-day readmission rates.

Results: Pre-intervention data showed 158 (67.8%) of records revealed a clearly-identified discharge summary documented in the medical record with only 22 (13.9%) with all of TJC required components. Post-implementation, 244 records showed 187 (76.7%) records with a discharge summary, and 56 (29.9%) records containing all TJC required elements, showing an 8.8% and 16% improvement respectively. An additional set of data of 60 eligible charts was reviewed 2 months after the one-on-one education to further assess compliance with results of 51 (85%) overall compliance, and 34 (56.7%) with all TJC elements, or 17.2% and 42.8% further improvement in compliance. In addition, 30-day readmission rates were reviewed for the months of June – October 2018 revealing 30-day readmission rates for Medicine discharges at 20.4%, 19.0%, 18.2%, 16.6%, and 13.4% respectively, showing a 6.6% reduction between June and October.

Conclusion: Given the discharge summary's pivotal communication role in care transitions, omitted patient discharge summary information is a concern and may affect patient safety. Data from this study shows a correlation with increased compliance to The Joint Commission standardized discharge summary criteria and a reduction in 30-day readmissions for patients with a medical discharge diagnosis.

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NEW YORK RESEARCH POSTER FINALIST - Laila Khalid, MD

Opioid Dose Reduction Outcomes in a Resident Teaching Practice for patients with chronic pain.

Authors: Laila Khalid MD MPH, Serena Roth MD, Joanna L. Starrels MD MS

Introduction: The Power Over Pain (POP) Clinic was developed to train internal medicine residents in opioid management and provide guideline-adherent care for patients on chronic opioid therapy (COT).

Objective: To determine whether patients seen in POP Clinic patients had an opioid dose reduction after 6 and 12 months and to assess whether multiple visits in POP Clinic visits was associated with greater dose reduction.

Methods: Retrospective study conducted in an urban internal medicine teaching clinic. Eligible patients were seen in POP clinic at least once between 9/1/16 and 4/1/18 and were on COT (≥3 opioid prescriptions in past 6 months). Using manual chart review of electronic medical records, we determined patients' total prescribed daily opioid dose at their initial visit (baseline) and at 6 and 12 months, in morphine-equivalent daily dose (MEDD). We calculated percent change in MEDD at 3 and 6 months for each patient. We conducted paired t-tests to compare mean MEDD at 6 and 12 months compared to baseline. We also conducted t-tests to compare mean change in MEDD at 6 and 12 months from baseline, in patients with one POP clinic visit vs. multiple visits.

Results: Of 79 eligible patients, 66% were female, median age was 59 years, 57% were Hispanic, 63% had back pain, and mean PEG score was 7/10 (moderately severe). At baseline, median MEDD was 69 mg (range 2-500 mg). Patients had a mean of 2 visits to POP clinic (range 1-7) and 34 (43%) had multiple visits. Overall, 55 % had a dose reduction between baseline at 6 and 12 months; mean MEDD reduction at 6 months was 58% (p=0.01) and mean MEDD reduction at 12 months was 56% (p=0.01). Mean dose reduction at 6 months for patients seen once vs. multiple times was 59.0 % and 56.0 %, respectively (p = 0.73). At 12 months, mean dose reductions for these two groups were 61 % and 51 %, respectively (p = 0.29).

Conclusion: The majority of patients at a resident-led opioid management clinic had mean MEDD reduction at 6 and 12 months. Higher engagement in POP clinic was not significantly associated with a larger opioid dose reduction at 6 or 12 months.

NEW YORK RESEARCH POSTER FINALIST - Leonidas Palaiodimos, MD

Predictors of Vertigo in the Emergency Department: The PREVED Study

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Introduction: Acute vertigo can be the sole manifestation of a vertebrobasilar stroke, with estimated prevalence as high as 20%. An estimated one-sixth to one-third of these posterior circulation strokes presenting as isolated vertigo are missed in the emergency department (ED). The studies for evaluation of central vertigo focus on physical exam findings like HINTS (Head-Impulse, Nystagmus, Test-of-Skew), which require expertise and may not be suitable for rapid triage by a nurse in the ED, or by paramedics. We designed this study to evaluate the predictors of central vertigo in the ED, which can improve the sensitivity of detecting or excluding central vertigo early, as delayed recognition or missed diagnosis can have devastating consequences.

Methods: This cross-sectional study included a retrospective chart review of all the adult patient visits, who presented to the NYC Health + Hospitals/Jacobi ED with dizziness or vertigo in 2016. Only patients with a final diagnosis of vertigo were included in the analysis. SPSS software was utilized for the data analysis. Chi-square test and univariate logistic regression were used to evaluate statistical correlation and to calculate prevalence odds ratio (POR). Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated using the 2X2 table created by cross tabulation.

Results: Two hundred and forty-nine (249) out of 505 (49.3%) patients presenting with dizziness had actual vertigo, out of which 16 (6.4%) were found to have central vertigo. Statistically significant subjective variables were constant symptoms of vertigo (*p* 0.000- POR 10.067) and no change in symptoms with head movement (*p* 0.001- POR 5.61). Regarding the physical examination signs, dysmetria (*p* 0.000- POR 16.833) and unsteady gait (*p* 0.000- POR 10.063) were found to be statistically significant. The sensitivity to detect central vertigo was 100% if the patient had either no change in symptoms with head movement, or unsteady gait, or constant symptoms. The combination of ear symptoms and changes of symptoms with head movement was found to have a sensitivity of 100% to rule-out central vertigo. The combination of a positive Dix-Hallpike test and changes of symptoms with head movement had a sensitivity of 100%, as well. Magnetic resonance imaging of the brain was considered the gold standard to diagnose central vertigo and was obtained in 47 out of 248 patients (18.9%).

Conclusion: Vertigo can be the sole manifestation of vertebrobasilar stroke, and they often get missed in the ED. In our patient population, the sensitivity to detect central vertigo was 100% in patients with either constant vertigo symptoms or no change in symptoms with head movement or unsteady gait (VAIN: Vertigo-Ataxia, Incessant, Non-positional). We suggest that an urgent neurological consultation should be obtained for such patients. This can serve as a simple and effective tool for paramedics and triage nurses in the ED.

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NEW YORK RESEARCH POSTER FINALIST - Stefanie Reiff, MD

Increasing Electronic Medical Orders for Life Sustaining Treatment: Improving High Value Care Through Advance Care Planning

Authors: Stefanie Reiff, MD; Lorna Lee-Riley, LMSW, CCM; Christine Wilkins, Ph.D., LCSW

Introduction: While Medicare data demonstrates that healthcare spending is up to four times higher in yearly decedents than survivors, studies demonstrate that early advance care planning (ACP) leads to improved clinical outcomes and reduces cost without increase in patient anxiety or depression. Nationwide the creation of the Physician Order for Life Sustaining Treatment (POLST), a traveling do not resuscitate (DNR) medical order that is applicable in any care setting (including at home), has improved ACP as patients with POLSTs are more likely to have their treatment preferences known and honored than patients without this document.

Our goal was to increase the number of ACP conversations with completion of electronic Medical Orders for Life Sustaining Treatment (eMOLST), the New York State electronic equivalent of a POLST, for patients who are DNR during their inpatient Internal Medicine admission.

Methods: Completion rates of the eMOLST on all patients with a DNR order admitted to the Internal Medicine service were examined from September 2017 through August 2018. Two interventions were performed:

1. In January 2018 the hospital linked the electronic medical record (EMR) directly to the eMOLST via single sign-on.

2. From January 2018 through March 2018 all Internal Medicine hospitalists, residents, social workers, and case managers underwent an in-person, one-hour training on eMOLST completion. From April 2018 through the end of the study period providers received weekly email reminders to complete eMOLSTs. One additional education session was held in July 2018 for new residents.

The completion rate of the eMOLST for patients with a DNR order within the Department of Medicine was then compared before (9/2017-3/2018) and after the intervention period (4/2018-8/2018).

Results: Prior to the intervention period the average monthly completion rate was 12.5% (range 8.1-20.7%) with an increase to 54.5% (range 24-75.8%) after the intervention period. Completion rates remained above 50% from June 2018 throughout the rest of the study period.

Conclusion: By linking the eMOLST to our EMR, engaging in a brief educational intervention, and providing weekly email reminders we were able to demonstrate a 4.5 fold, sustainable increase in eMOLST completion rates within the Department of Medicine on all patients with a DNR order. To the best of our knowledge this is the first demonstration of the efficacy of a direct link from a state-wide eMOLST registry to an EMR. It also demonstrates that sustainable change in provider ACP practices can be achieved with an interdisciplinary intervention. Given prior studies showing a reduction in healthcare expenditure, improved patient experience, and higher fulfillment of patients' wishes with ACP discussions/eMOLST completion we hypothesize that over time our increase in eMOLST completion will lead to improved end of life care and a sustainable decrease in cost at our hospital.

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NORTH CAROLINA RESEARCH POSTER FINALIST - Kathleen Marshall, MD

Give Us a Break! Evaluating rates of osteoporosis treatment following fragility hip fractures in a community health system

Authors: Kathleen Marshall and Golnosh Sharafsaleh

Background: Hip fractures are associated with a one year 25% mortality rate. Individuals who sustain a hip fracture suffer loss of independence, a decrease in overall mobility, and are 2-4 times more likely to have a repeat hip fracture than those without fracture history. Increased bone fragility and loss of muscle mass in the elderly population puts these individuals at risk of falls and fractures. Bone mineral density declines more rapidly in the year following a hip fracture. Treatment with osteoporosis medication can reduce the risk of subsequent fractures, reduce mortality, and improve quality of life1. Multiple studies have shown low rates of pharmacological treatment of osteoporosis following fragility fractures, ranging from 3-40%2.

Methods: A retrospective chart review was utilized to identify new diagnoses of hip fracture within a community hospital system from January 2017 through December 2017. Charts were reviewed to determine if an osteoporosis treatment was prescribed or recommended anytime during a 12 month follow up. Subjects' ages and time to treatment were also noted.

Results: Of 206 charts with hip fracture diagnoses, 68 were for hip replacement surgeries for osteoarthritis or fractures related to high velocity trauma and were eliminated from analysis. 23 were eliminated because of hospice status or because patient expired. 4 were already on osteoporosis treatment. Of the remaining 111 subjects, 11 were started on osteoporosis treatment, 9.9% (95% CI 5.5-17%). Mean age of subjects: 79.12 years (SD 9.5). Mean age of those treated: 73.7 (SD 7.9). Difference in age was not statistically significant (p=0.070). Mean time to onset of treatment was 137 days (SD 153).

Conclusion: There is a substantial treatment gap in patients with fragility fractures receiving recommended drug treatments for osteoporosis. This community hospital demonstrated suboptimal rates of post fracture treatment. Future studies could help eludicate barriers to prescribing osteoporosis medication after hip fractures. Fracture Liaison Services have demonstrated improved rates of secondary preventive treatment and could be explored at this institution and analyzed for cost effectiveness.

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OHIO RESEARCH POSTER FINALIST - Keerat Ahuja, MD

Impact of Atrial Fibrillation on 30 days Readmission Rate Of Takotsubo Cardiomyopathy: A Nationwide Analysis

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Introduction: Takotsubo Cardiomyopathy (TC) has been known to be associated with many common arrhythmias including Atrial fibrillation, but it is unknown whether these arrhythmias have impact on readmission of these patients.

Methods: Nationwide readmission database (NRD) for year 2014 was queried for patients admitted with primary diagnosis of Takotsubo Cardiomyopathy using ICD-9 diagnosis code 429.83. Readmission rate was determined. Arrhythmias including Atrial fibrillation, Atrial flutter, Ventricular fibrillation and Ventricular tachycardia were determined using separate ICD 9 Diagnosis codes. Logistic regression analysis was used to determine impact of arrhythmias on readmission.

Results: A total of 7618 weighted discharges were analyzed. Over all Mean age was 66.68 ± 12.9, among them 91.8% were females. In this cohort 17% (n=1296) patients had documented Cardiac arrhythmias. Atrial Fibrillation (12.9%) was the most common arrhythmia followed by Ventricular Tachycardia (3.8%), Atrial flutter (1.6%), Ventricular fibrillation (1.2%) and Paroxysmal Supraventricular tachycardia (0.6%). 30 days readmission rate was significantly higher among patients with arrhythmias as compared to patients without arrhythmias 15.6% vs 8.4% p-value < 0.01. Atrial Fibrillation (OR 1.93, 95% CI: 1.5-2.35, p-value < 0.01) and Ventricular Tachycardia (OR: 2.32, 95% CI 1.68-3.203, P-value < 0.01) were determined to be independent risk factors for 30 days readmission after adjusting for age, gender, hypertension, history of congestive heart failure, diabetes complicated and uncomplicated , obesity, and history of chronic renal failure.

Conclusion: Arrhythmias, notably atrial fibrillation and ventricular tachycardia have significant impact on 30 days readmission rate for patients admitted with TC. Strategies aiming towards mitigating these factors can have useful impact on healthcare utilization.

PENNSYLVANIA RESEARCH POSTER FINALIST - Alan Kubey, MD

Trust the Process: A Templated, Centralized, and Protocolized Patient Safety Pilot Project to Improve Outside Admissions

Authors: Alan Kubey, MD and Jeffrey Riggio, MD

Introduction: Transfers are high-risk. Intra-hospital transfer processes research has improved protocols used nationally. Outside-hospital admissions remain without standards ensuring the transfer of the right information to the right clinician at the right time; presently, patients can arrive at a new hospital with limited-to-no information. We trialed a novel process for outside (hospital, provider, or skilled nursing facility) admissions to a single academic medical center's resident-and-hospital-medicine-attending-based ("teaching") medicine services.

Methods: After reviewing literature, the Epic UserWeb, and seeking clinician input, a templated note was created to centralize documentation. The template, used by attendings while speaking with an outside clinician, captures critical information (transfer reason, history, vitals, imaging, labs, cultures, antibiotics, inter-service discussions, and tentative plan); it also incorporates "nudges" to encourage asking the standard-of-care questions and following a new intra-hospital communication checklist to advise the appropriate clinicians of pending admissions. Residents and attendings were educated regarding the new process electronically and in person, both in group and individually.

Apriori subjective resident and attending outcomes were obtained through an electronic pre-post survey administered one-week prior and 90-days post intervention. Apriori objective patient outcomes were determined through 90-day pre-post chart review.

Results: With 60/38 (pre/post) residents and 12/7 attendings responding, the primary outcome demonstrated a trend toward improved documentation sufficiency on patient arrival: 21.70% (pre)/39.50% (post); $p = 0.062$ (residents). Secondary outcomes include an improved satisfaction with the admission process: 5% (pre)/66% (post); $p<0.001$ (residents); 17%(pre)/71%(post); $p=0.036$ (attendings); and an improved sense of patient safety: 3%(pre)/63%(post); $p<0.001$ (residents); 17%(pre)/71%(post); $p=0.036$ (attendings). The majority found the templated note "useful" or "very useful": 84% (residents), 86% (attendings). Attendings spent less total time on outside admissions. With zero responding "no," 95% of residents and 86% of attendings favored implementing the process permanently across all department of medicine services.

124 pre-intervention and 128 post-intervention patients were reviewed; the 98/128 (78.6%) post-intervention patients for whom providers followed the process were included for comparison, revealing: RRT within 24 hours of admission trended from 1.6% (pre-intervention) to 0% (post-intervention); ICU transfer within 24 hours trended from 0.8% to 0%; 30-day readmission trended from 12.9% to 11.2%; inpatient mortality trended from 1.6% to 1.0%; and length of stay trended from 7.81 to 7.27 days.

Conclusion: A templated centralization of clinically-relevant outside admission information and protocolized communication process non-significantly improves clinicians' assessments of documentation sufficiency while significantly improving clinician satisfaction and sense of patient safety. We report no significant changes in patient outcomes but note promising trends across multiple patient safety and outcome metrics that deserve further study. Our institution is currently refining the template and process for adoption across all medicine specialties. We encourage inter-institutional collaboration and lesson-sharing on this topic.

PENNSYLVANIA RESEARCH POSTER FINALIST - Sam Stern, MD

FROM HOSPITAL TO HOME: CREATING CARE TRANSITIONS STANDARDS FROM CONSENSUS USING NOMINAL GROUP TECHNIQUE

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Introduction: The ACGME identifies care transitions as both a core competency and focus area for the Clinical Learning Environment Review, but there is a scarcity of literature on standardized curricula designed to teach residents how to facilitate safe discharges. While focusing on the patient as the central locus of the transition is important, an under-appreciated aspect is teaching communication skills for effective and safe care transitions practices. Our institution sought to create and implement a longitudinal formalized care transitions curriculum and standardize the process of discharging patients. During an initial needs assessment, differing stakeholders with multiple perspectives on care transitions drove us to utilize nominal group technique, an organized brain-storming approach.

Methods: To derive the key curricular tenants of a transitions of care curriculum and highlight elements that are important for patient safety during the discharge process, we conducted a focus group of primary stakeholders. These stakeholders included primary care physicians, hospitalists, geriatricians and sub-specialists, those impacted most by care transitions hand-offs. During the focus group we utilized nominal group technique to engage participants, and focus the conversation. The nominal group technique is a structured consensus method that is used in business to achieve a general agreement or convergence of opinion around a particular topic. Here we innovatively applied it to curricular development and improvement of patient safety at discharge.

Results: Twenty themes were identified after round robin reporting and idea generation. The items deemed most important included: creating an accurate discharge medication list, writing accurate discharge summaries, identifying patients who require a “warm” hand off, and precise patient-centered discharge instructions. This approach yielded positive feedback from providers, and promoted dynamic dialogue amongst outpatient and inpatient physicians to drive discussion around educational necessities and key patient safety barriers at the time of discharge. These fundamentals have been utilized as the core of the care transitions curriculum and have led to standardization of discharge practices at the hospital level. The implementation embraces an interdisciplinary approach amongst hospitalists, nurses, nursing care managers, and pharmacists, to teach, model, and evaluate residents in these different domains.

Conclusion: We learned that the nominal group technique is a useful tool that can be applied to curriculum development and to creation of consensus for hand-offs at the time of discharge. During our focus group of inpatient and outpatient physicians, use of the nominal group technique helped identify curricular elements and domains to improve care transitions within the hospital structure at the time of discharge. Going forward, we anticipate improved overall provider and patient satisfaction with the resident learners, hospitalists, and the providers assuming the care of patients following discharge.

VIRGINIA RESEARCH POSTER FINALIST - Shant Ayanian, MD, FACP

Using Machine Learning to generate a predictive model for timely hospital discharges.

Authors: Shant Ayanian MD MS FACP; Juan Reyes MD MPH FACP; James Gehring MD FACP; Courtney Paul MD

Introduction: Hospital overcrowding is a nationwide issue and is of particular concern in the Emergency Department (ED). Overcrowding has been associated with frequent ambulance diversions, long wait times for ED walk-in patients, poor patient satisfaction, and perceived increased risk to patient safety. Capacity management and early patient discharges have been described in the literature as 2 major factors that can positively impact hospital overcrowding. Our study seeks to analyze multiple factors attributable to patients, providers and hospital system characteristics that potentially impact timely discharge by 11 am of patients on the Internal Medicine service. In doing so, we created a machine learning pipeline which predicts which patients are most likely able to depart prior to 11am.

Methods: Data was extracted from the electronic medical records system at the George Washington University Hospital (GWUH) between July 1st 2017 and February 1st 2018. The extracted fields included a combination of patient, provider, hospital factors and illness characteristics (summarized by the Elixhauser disease severity score). A total of 131 different variables were obtained. The open source statistical software R was used to run two separate models; a penalized regression model for variable selection and then a robust random forest for predictive model generation. The target outcome was discharge prior to 11 am, which was 4.56% of the total number of discharges. A balancing algorithm (ROSE) was run to increase the occurrence of the target variable to 20% creating a more robust predictive model. The data was divided into a training and a testing datasets at an 8:2 ratio.

Results: The penalized regression algorithm generated 38 variables which had a regression coefficient different than zero. All of these variables were then included in the generation of the predictive model. The training dataset was used to train the random forest predictive model. The testing dataset was used to validate the model achieving a predictive accuracy of 99%. The 8 variables with the highest Gini coefficients from the initial random forest model (containing the 38 variables) were used to create a sparser model, which was subsequently tested and achieved a similar high predictive accuracy of 96%.

Conclusion: Using machine learning offers a powerful tool that can predict the patients who can be discharged early with a high level of accuracy. This helps identify which beds will be available to improve overall flow and prioritize resouces. Predictability of early discharges is predicated on the unique variables of the individual institution. This model can be incorporated easily into an existing EMR to identify potential early discharges and help mobilize resources. In addition, this same pipeline can be applied to other patient care applications.

VIRGINIA RESEARCH POSTER FINALIST - Amber Inofuentes, MD

Precision "Medicine": An Individualized Approach to the Highest Utilizers of Hospital-based Care

Authors: Amber Inofuentes, MD, Katharine Schlag, RN, Garret Rhodes, Paul Helgerson, MD, University of Virginia Health System, Charlottesville, VA

Introduction: Nationally, a minority of patients with complex medical and psychosocial needs consume a disproportionate amount of healthcare. In the U.S. in 2015, 5% of the population accounted for 51% of healthcare costs, while the top 1% accounted for 23% of all expenditures and cost 10 times more per year than the average patient. No one disease accounts for a large percentage, therefore disease-specific interventions are unlikely to work to reduce unnecessary utilization. There is a need for interventions targeted at these high costs, high utilization patients in order to reduce thirty-day readmissions and hospital bed days while improving the quality and consistency of care. A novel approach using the implementation of individualized care plans (ICPs) has been deployed successfully with reductions in inpatient utilization patterns at large urban-based hospitals but to our knowledge has not been replicated in a non-urban setting.
In 2016, a small cohort of patients with sickle cell disease (SCD) were identified (based on weekly review of all readmissions) as a high utilizer (HU) population who accounted for 7% of all readmissions to the general medicine services and nearly $1 million in annual costs.

Methods: Beginning in early 2017, a multidisciplinary team collaborated to create longitudinal ICPs for nine HU patients with SCD. Creation of the plans included extensive chart review, meeting with each patient to prompt his/her input, and soliciting recommendations from physician and non-physician disciplines for a 360-degree view of each patient. This process produced a concise summary of each patient's medical and social history and prior utilization that also outlines detailed strategies for optimal care across the inpatient-outpatient continuum; in essence, a roadmap to care for a "common presentation" of the patient's chronic illness, with focus on complex pain and behavioral management. Once developed, ICPs were made available in the EMR for use by inpatient, outpatient, and emergency department providers.

Results: In a pre-post analysis of the pilot cohort comparing four quarters pre and post intervention (as marked by the implementation of seven of the nine eventual ICPs), admissions and total hospital bed days were reduced by 64% and 43%, respectively, and thirty-day readmissions were reduced by 76%. Total costs were reduced by 24% from $949,935 to $717,226. Following implementation, with a sustained effect for the past 4 quarters, this high utilizer cohort accounts for <2% of the general medicine thirty-day readmissions.

Conclusion: Patients with high utilization patterns require a multidisciplinary and individualized approach. The implementation of ICPs is an effective strategy to improve consistency of care and reduce unnecessary inpatient utilization among high utilizer patients with sickle cell disease, even in a non-urban hospital setting. This approach requires significant time investment by a dedicated team, but has significant potential return on investment to health systems, care providers, and patients.

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EARLY CAREER CLINICAL VIGNETTE PODIUM PRESENTATIONS

HAWAII CLINICAL VIGNETTE PODIUM PRESENTATION - Zao Zhang, MD

Helminthic Cholangitis without Obvious Source of Transmission

Authors: Zao Simon Zhang, MD[1], You Ping Deng, PhD[2], Ting Gong, MD, MPH[3,] 1 The Queen's Medical Center, Honolulu, HI, 2 Biostatistics and Bioinformatics Core, John A Burns School of Medicine, University of Hawaii, Honolulu, HI, 3 Department of Tropical Medicine, Medical Microbiology, and Pharmacology, University of Hawaii John A. Burns School of Medicine, Honolulu, HI

Introduction: Ascaris lumbricoides is one of the most common human parasites. Globally, over 1 billion people were infected but 85% of cases remain asymptomatic until a higher worm load is reached. Symptomatic ascariasis can cause intestinal obstruction and hepatobiliary or pancreatic manifestations.

Case Presentation: A 61-year-old woman with uncontrolled type 2 diabetes mellitus presented with progressive right upper quadrant (RUQ) abdominal pain of 1 month's duration. The pain was sharp, intermittent without radiation, and not exacerbated with meals. She denies surgical history or alcohol intake. She immigrated from Chuuk one decade ago and had no recent travel. Vital signs showed a fever of 38.5 °C, tachycardia of 104 /min, and hypertension of 205/92 mmHg. Physical examination was remarkable for slight conjunctival jaundice, RLQ tenderness, and a positive Murphy's sign. Laboratory tests were significant for WBC 16.4 $x10^9$ /L (neutrophil 87.4%, lymphocyte 7.5%, eosinophil 0.5%), AST 514 U/L, ALT 236 U/L, ALP 208 IU/L, total bilirubin 2.5 mg/dL (direct bilirubin 1.1 mg/dL). Lipase was normal and viral hepatitis panel negative. Computed tomography showed no biliary dilation but a pericholecystic fluid concerning for cholecystitis. However, ultrasonography revealed only gallbladder sludge and no cholecystitis. MRCP disclosed an unusual linear filling defect within the common bile duct through the left hepatic duct. Subsequent ERCP discovered numerous roundworms in the biliary trees. Pathology identified Ascaris species and stool Ova & Parasite tests revealed Ascaris lumbricoides. The patient received albendazole 400 mg orally. The next day, she was noted discharge of worms from her mouth. Although there was no active helminth infection in her family, they were recommended for work-ups for possible asymptomatic infections.

Discussion: Ascariasis, a helminthic disease caused by intestinal nematode, is endemic in tropical regions such as Southeast Asia, Africa, and South America, where poor sanitation often induces contamination of soil, water, and food. An estimated of 4 million people are infected in the US and most of these are immigrants. Our patient immigrated from Micronesia, a group of tropical islands in the western Pacific Ocean, where ascariasis is highly prevalent. However, she has resided in Hawaii for the past 10 years. The source of transmission was unclear. Typically, adult worms do not multiply in human and are passed into stool after a lifespan of 10-21 months. The worm burden in a single infected individual relies on the degree of exposure over time. Therefore, it is unlikely that our patient had remained asymptomatic since her last exposure to the endemic region. However, her family members who have recently traveled between Hawaii and Micronesia may have transmitted the infection. There are reports of asymptomatic infected individuals shedding eggs for years. Considering helminthic infection in patients without overt exposure is needed since transmission from asymptomatic infections can occur.

EARLY CAREER CLINICAL VIGNETTE POSTER FINALISTS

ARIZONA CLINICAL VIGNETTE POSTER FINALIST - Ricardo Correa, MD, FACP

When to Sweat the Details: A Case of Adult Hypophosphatasia

Authors: Ricardo Correa Marquez MD, Gauri Behari MD.

Introduction: Hypophosphatasia (HPP) is characterized by defective mineralization of bone due to low activity of serum bone alkaline phosphatase. Adult forms are characterized by stress fractures and pseudofractures of the lower extremities and early loss of adult dentition. Here we present a case of adult HPP with a novel variant of the *ALPL*gene (p.Ala105Asp).

Case Presentation: A 59-year old male with past medical history of chronic pain, polyarthralgia, multiple tendon/muscle tears, severe periodontal disease, requiring multiple fillings and crowns since his early 20s, and calcium pyrophosphate deposition disease (CPPD) presents with progressively worsening peripheral neuropathy in his feet. He has a left fifth metatarsal small avulsion non-healing fracture and old left non-union tibial sesamoid fracture with loss of physical function impacting ADLs, requiring assistance with mobility. Vitamin B6 was 127.7 ng/mL [2.1-21.7 ng/mL] and alkaline phosphatase was 18 U/L [53-128 U/L]. Genetic testing was done which revealed he has a heterozygous variant of *ALPL*gene (p.Ala105Asp). He has 3 family members with variants of *ALPL*gene and have since been diagnosed with hypophosphatasia. Rest of the family are asymptomatic. The patient is currently undergoing evaluation for treatment with recombinant alkaline phosphatase, asfotase alfa.

Discussion: Adult HPP may be inherited in an autosomal recessive or autosomal dominant manner, depending on the effect that the *ALPL*pathogenic variant has on TNSALP activity. Heterozygotes (carriers) are either asymptomatic (may manifest biochemically but not clinically) or symptomatic. This patient had a heterozygous variant in the *ALPL*gene (p.Ala105Asp), which, to our knowledge, has not been reported in association with *ALPL*-related conditions, however other variants flanking this position in the gene (p. Asn102_Asn104del, p.G1n106His) have been associated with adult, perinatal, and infantile HPP, suggesting a change at this position adversely affects protein structure and/or function. Furthermore, this variant has not been reported in the broad dataset (individuals without severe childhood onset disease).

Adult HPP is a rare disorder that is often underdiagnosed due to varying nonspecific symptoms. Awareness of the disease and identification of patients who have findings such as elevated vitamin B6 and low alkaline phosphatase is essential prior to confirming diagnosis with genetic testing. Diagnosis is paramount as patients with this disorder can now be treated with recombinant alkaline phosphatase. This case was remarkable as this patient has a heterozygous novel variant in the *ALPL*gene (p.Ala105Asp).

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CONNECTICUT CLINICAL VIGNETTE POSTER FINALIST - Omair Tahir, MD

CURIOUS CASE OF SEVERE ORTHOSTATIC HYPOTENSION… SERONEGATIVE AUTOIMMUNE AUTONOMIC GANGLIONOPATHY

Authors: Omair Tahir, MD: Adil Bhutta, MD

Introduction: Lightheadedness, feeling dizzy or faint is a common presenting complaint, especially in the elderly population and often accompanied with falls. Orthostatic hypotension is a common cause of this presentation. It is important for clinicians to differentiate orthostatic hypotension with appropriate chronotropic response, such as due to hypovolemia, sepsis and medication side effects, from orthostatic hypotension with an impaired chronotropic response, suggesting either AV nodal blockade or dysautonomia. We present a case of severe orthostatic hypotension in a middle-aged female due to acute autonomic ganglionopathy.

Case Presentation: A 56-year-old woman with severe spinal stenosis, chronic pain and resistant hypertension on several antihypertensive medications who presented with lightheadedness and dizziness resulting in a fall. She reported postural worsening in her symptoms. She reported good fluid intake and denied any diarrhea, polyuria, fever, loss of consciousness, palpitations, dry eyes, dry mouth or urinary retention. Vital signs on presentation were notable for low normal blood pressure despite stopping anti-hypertensives. Orthostatic vital signs revealed a 40-point drop in systolic blood pressure and only 5-10 beats per minute increase in her heart rate. She was given intravenous fluids and all her anti-hypertensive medications were held without any improvement. Telemetry did not reveal any arrhythmias and endocrine workup was unremarkable. Echocardiogram and MRI brain did not reveal a cause for her severe orthostasis. CSF studies and rheumatological serologies were unremarkable. The absence of chronotropic response despite holding beta blockers raised concern for autonomic dysfunction.

The patient was evaluated by dysautonomia specialist and autonomic testing confirmed the patient's diminished sympathetic response. Acetyl Choline neuronal antibody and paraneoplastic antibody panel were unremarkable. She was diagnosed with acute seronegative autoimmune autonomic ganglionopathy. She was treated with intravenous immunoglobulins and intravenous methylprednisone with improvement in orthostatic hypotension and remarkable improvement in her symptoms.

Discussion: Autoimmune autonomic ganglionopathy is a rare cause of neurogenic orthostatic hypotension. More common causes being either pre-ganglionic, such as Parkinson's disease, Lewy Body Dementia, and Multiple Systems Atrophy or post-ganglionic, such as autonomic dysfunction related to Diabetes, HIV etc. Common presenting symptoms of autonomic ganglionopathy include orthostatic hypotension, anhidrosis, dry eyes, dry mouth, impaired pupillary reflexes, urinary retention and sexual dysfunction. This multisystem involvement makes it extremely debilitating for many patients and makes prompt diagnosis and treatment very important. Most patients have a good response to immunomodulating treatments like high dose steroids, intravenous immunoglobulins, mycophenolate and plasmapheresis. This case highlights the importance of physiologic understanding of orthostatic hypotension. Orthostatic hypotension is a commonly encountered presentation for many internists. A better understanding of the pathophysiology, as well as awareness about autonomic disorders, can help in early diagnosis which carries huge implications on patient outcomes.

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INDIANA CLINICAL VIGNETTE POSTER FINALIST - Amna Anees, MD, FACP

All that leads to lead toxicity; A case of adult lead toxicity masquerading as acute porphyria

Authors: Amna Anees MD

Introduction: Lead toxicity is a rare diagnosis encountered during medical practice. Chronic lead toxicity is challenging to diagnose. It can present with fatigue, constipation, abdominal pain, irritability, and other nonspecific symptoms. Due to a low incidence, it is often not considered in the differential diagnosis of patients presenting to the hospital which can lead to unnecessary testing or misdiagnosis. It may also masquerade as acute porphyria.

Case Presentation: A 47 year old woman visiting from Iran presented to the ER with diffuse, severe, colicky abdominal pain. She had a prior diagnosis of acute porphyria and hypertension. Her initial CT scan in ED showed some thickening of colon wall. She was treated for nonspecific colitis. Her pain responded to analgesics. She tolerated a diet the next day and was discharged home. She was readmitted in 2 weeks with persistent abdominal pain. This time, she had a repeat abdominal CT scan which showed resolving colitis. EGD and colonoscopy were negative. With no apparent cause found for her abdominal pain, focus was shifted to porphyria. Hematology was consulted and recommended treatment with hemin which patient refused because of cost issues. Her total urine porphyrin level was high. However her urine porphobilinogen level was negative. With no clear diagnosis, her lead level was tested and returned after her discharge from hospital at 149 mcg/dL (Range <10 mcg/dL). After an extensive history to find the source of lead, patient did admit to using “Surma” (an eye cosmetic with high lead levels). With an extremely high lead level, patient was advised to present to the hospital to undergo chelation. However because of cost issues she refused. She travelled back to Iran against medical advice and was admitted there for chelation. She is currently doing well after chelation therapy.

Discussion: Lead toxicity is a rare yet potentially fatal diagnosis. There are multiple sources of lead including cosmetics like lipstick. A cosmetic used as eyeliner, “surma” also contains unregulated and potentially high levels of lead. In our patient, the diagnosis was challenging given the prior diagnosis of acute porphyria which proved to be erroneous as well as normal hemoglobin, kidney and liver function. The abdominal pain is generally associated with lead levels of 46-200 mcg/dL. Lead can casue inhibition of ALA desynthetase causing false positive porphyrin level. It is important to consider lead toxicity in the case of no clear etiology of abdominal pain, inconclusive testing for porphyria and/or no response to hemin. Treatment of lead toxicity depends on the lead level as well as the prescence of symptoms. Chelation is the mainstay of treatment if lead level is more than 80 mcg/dL.

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INDIANA CLINICAL VIGNETTE POSTER FINALIST - Jennifer Mundell, MD, FACP

Too Much of a Good Thing: Interesting Case of Vitamin C Toxicity

Authors: Jennifer Mundell, MD, FACP

Introduction: When patients are facing desperate situations, they will sometimes turn to anything that is easily obtained, claims effectiveness, and promises to carry fewer side effects. We present a patient with worsening stage IV ovarian cancer despite bevacizumab who developed rapidly progressing renal dysfunction surprisingly due to vitamin C toxicity. There are 1.5million subscribers to the same website our patient referenced when asked why, highlighting the hidden dangers of supplements marketed as miracle cures.

Case Presentation: 75yo Caucasian lady with a history of hypertension and stage IV ovarian cancer on bevacizumab was admitted for observation following a renal biopsy for rapidly progressive renal failure of unknown etiology. Her creatinine had risen from a normal baseline to 5.5 over 6 months necessitating the renal biopsy. Despite the rapid progression, she was still making urine and maintaining her electrolyte levels. When her creatinine had risen to the mid 3's, her bevacizumab was thought to be the culprit initially and it was stopped. Unfortunately, her renal function continued to decline, and she proceeded with the biopsy. The biopsy was expected to show evidence of thrombotic microangiopathy, an established association with bevacizumab use. Surprisingly, the pathology showed only low grade thrombotic microangiopathy with most of the injury being tubulointerstitial nephritis with oxalate crystals associated with vitamin C toxicity. It was not until after the biopsy results, did a clinician ask her to clarify how much vitamin C she was consuming. The patient had been taking 4000mg a day of vitamin C as well as consuming a high oxalate diet that she referred to as her cancer killing diet. The patient's son had showed her a website that offered advice on how to kill cancer cells that included ingesting high doses of vitamin C and being on this high oxalate diet. Her renal function stabilizing around 5% and since the patient was asymptomatic, hemodialysis was not initiated. She was discharged unfortunately with permanent discontinuation of the bevacizumab, the one medicine that was slowing the progression of her disease.

Discussion: The daily allowance recommendations are adjusted for age, gender, and renal function to avoid what seems to be irreversible renal toxicity. Case reports have shown rapidly worsening renal failure due to vitamin C toxicity with as low as 420mg/day. Case reports also demonstrated no benefit in steroid therapy and most patients became hemodialysis dependent. On the surface, this case demonstrates the need for clinicians to view supplements as medications with side effects and ask, "How much?" Digger deeper, it highlights the growing mistrust against healthcare providers with patients turning to other resources for medical advice

IOWA CLINICAL VIGNETTE POSTER FINALIST - Jennifer Langstengel, MD

Influenza-associated hemophagocytic syndrome: a rare cause of cytokine storm

Authors: Jennifer O'Loughlin Langstengel, MD, Manish Suneja, MD

Introduction: Hemophagocytic lymphohistiocytosis/macrophage activation syndrome (HLH/MAS) is a rare clinical entity characterized by macrophage and activated histiocyte proliferation and infiltration with marked hemophagocytosis in bone marrow, liver, and/or lymph nodes. Clinical presentation is characterized by fever, pancytopenia, and hepatosplenomegaly leading to immunodeficiency and multiple organ system dysfunction. The inciting event in secondary HLH is often unclear; however, viral infections have been implicated. Influenza A has been reported to cause HLH/MAS in immunosuppressed pediatric patients. This case is the first reported influenza-associated hemophagocytic syndrome and subsequent cytokine stormin an immunocompetent adult.

Case Presentation: 24-year-old woman presented to the hospital with a three month history of worsening intermittent fevers as high as 40°Celsius. Her fevers increased in frequency to daily the week prior to admission, associated with arthralgias, fatigue, myalgia, and cough. Prior to the onset of these fevers, the patient was diagnosed with influenza A and completed oseltamivir. Approximately six weeks after her influenza diagnosis, she completed a course of azithromycin for presumed pneumonia. Three weeks later, she presented to a local hospital for worsening symptoms. Imaging demonstrated hepatosplenomegaly and retroperitoneal lymphadenopathy as well as bilateral lower lobe consolidations of the lungs consistent with pneumonia. She completed a ten-day course of oral levofloxacin without improvement. Given her persistent symptoms, she presented to a tertiary medical center two weeks later. Upon admission, she underwent an extensive infectious work-up, which was unrevealing. Treatment included steroids without symptomatic improvement. Her erythrocyte sedimentation rate (ESR) increased from 22mm/Hr to 29 mm/Hr, and the ferritin rapidly rose from 6,545 ng/mLto 25,280 ng/mL. Her past medical history was limited; however, the previous winter, she had a similar, less severe manifestation of these symptoms, also associated with a viral infection. She subsequently developed neutropenia and thrombocytopenia. Bone marrow biopsy, showed hemophagocytosis consistent with HLH/MAS; leading to the diagnosis of HLH secondary to influenza A infection.

Discussion: Viral-mediated HLH/MAS is primarily associated with Epstein-Barr virus (EBV) and cytomegalovirus (CMV) in the literature. Although HLH/MAS complicating influenza A infection has been reported, these case reports have occurred largely in immunocompromised patients and mainly affecting pediatric patients. Cytokine storm and HLH were first reported in the literature with Influenza with H1N1. The link between influenza A infection and HLH is relatively new, making it a difficult diagnosis due to the low index of suspicion. Although hematological abnormalities, such as lymphopenia and thrombocytopenia,are frequently associated with influenza A infection, they tend to be mild and are generally not associated with a poor prognosis. A patient with persistent cytopenias or other signs of cytokine storm should, in the appropriate clinical context, make the diagnostician consider influenza A associated HLH. Given the high mortality observed in HLH, it is crucial to make an early diagnosis and begin immunomodulatory therapy as soon as possible.

LOUISIANA CLINICAL VIGNETTE POSTER FINALIST - Muhammad Rawala, MD

A Rare Case of Adult Congenital Heart Disease: Single Ventricular Chamber with Anomalous Right Coronary Artery

Authors: Muhammad Shabbir Rawala, MD, Syed Bilal Rizvi, MD

Introduction: Patients with single-ventricle physiology encompass a wide array of anatomic subtypes, including but not limited to: tricuspid atresia, hypoplastic left heart syndrome, double-outlet or double-inlet ventricles. The outcomes for patients with single ventricle born before 1990 are relatively poor. We present a unique case of an 81-year-old who had survived with single ventricular chamber physiology without any corrective surgery.

Case Presentation: An 81-year-old female presented to the hospital as non-ST elevation myocardial infarction. She was started on antiplatelet and anticoagulation. Echocardiogram revealed a single ventricle which was thought to be left ventricle with possible transposition of great vessels.

Angiography was performed that identified the single ventricle and anomalous origin of the right coronary artery (RCA). She was also found to have double vessel coronary artery disease with diffuse stenosis of mid-RCA at 80% and proximal circumflex at 95%. She was managed conservatively as was high risk for CABG given her rare congenital condition.

Discussion: Patients with single ventricle are at risk of long-term morbidity, including heart failure, neurological injury, and early death. The mortality risk of these patients is high as most of the patients without corrective surgery do not proceed to adulthood. Those who proceed to adulthood mostly develop NYHA functional class III heart failure symptoms. Our case did have secondary polycythemia due to chronic hypoxia developed as a result of patient's cyanotic congenital heart condition. She was perfectly well with good mentation with oxygen saturation of 80-88%.

Our case had multivessel coronary artery stenosis along with a rare presentation of congenital heart disease in adulthood. The patient was offered percutaneous coronary intervention, but she declined and chose to be treated conservatively with only medical management.

We present a rare case of an elderly female surviving with a single ventricular chamber. The patient is an exception to the usual process of the pathology as most patients without corrective surgery seldom survive into adulthood.

LOUISIANA CLINICAL VIGNETTE POSTER FINALIST - Taylor Teague, MD

Drug Induced Acute Eosinophilic Pneumonia: Ustekinumab as the Culprit

Authors: Taylor Teage, MD; Harsha Mudrakola, MD; Nikhil Kolluri, MD; John R. Ogden, MD; Alexander J. Ryu, MD; Jaskanwal Deep Sara, MB

Introduction: Acute eosinophilic pneumonia is rare and is difficult to diagnosis. When encountered, it is often misdiagnosed as community acquired pneumonia because of its similar clinical presentation consisting of fever, cough, dyspnea and abnormal chest radiograph. Peripheral blood eosinophilia, when present, is a helpful clue, but its absence does not preclude the condition. Acute eosinophilic pneumonia usually occurs due to infections, medications, or toxins; but it can also be idiopathic. We present a case of a patient with Crohn's disease who was initiated on ustekinumab and four weeks later developed drug induced acute eosinophilic pneumonia.

Case Presentation: A 61-year-old man with Crohn's disease on weekly methotrexate developed mild fevers, cough and dyspnea one week after receiving his first dose of ustekinumab. He sought medical care from his primary care physician two weeks later because of worsening of his symptoms and was treated for presumed community acquired pneumonia with levofloxacin. A week later, he returned because his symptoms persisted. He was febrile, newly hypoxic with oxygen saturation of 89%, and had diffuse rhonchi on lung examination. Complete blood count revealed neutrophil predominant leukocytosis and mild eosinophilia (0.64×10^9/L). Chest radiograph showed bilateral infiltrates involving upper and lower lung fields. He was admitted to the hospital and started on broad-spectrum antibiotics. Over the next three days, he continued to clinically deteriorate and was eventually transferred to the medical intensive care unit for hypoxic respiratory failure. On hospital day four, he underwent bronchoscopy with bronchoalveolar lavage that showed 62% eosinophils on cell count differential. He was diagnosed with drug induced acute eosinophilic pneumonia from ustekinumab. All infectious workup was negative and broad-spectrum antibiotics were discontinued. He was treated with methylprednisolone 500 mg IV daily for three days and then transitioned to prednisone 60 mg daily for two weeks with a slow taper. He improved with treatment, ceased to require any supplemental oxygen and was discharged home on hospital day twenty.

Discussion: Most patients with acute eosinophilic pneumonia present with fever, cough, dyspnea and abnormal chest radiograph. Some, but not all, will have peripheral blood eosinophilia. Acute eosinophilic pneumonia is often mistaken for acute infectious pneumonia leading to a delayed diagnosis and increased morbidity and mortality. Physicians must maintain a high index of suspicion and consider it in patients who are clinically deteriorating despite appropriate medical care. Bronchoscopy is vital and confirms the diagnosis when cell count differential contains >25% eosinophils. After infectious etiologies have been ruled out, a thorough medication review must be performed. Simply withholding the offending medication will often lead to disease resolution. In severe cases with respiratory failure like ours, treatment also consists of corticosteroids.

Ustekinumab has been implicated as a cause of acute eosinophilic pneumonia. Literature review identifies two other cases of ustekinumab induced acute eosinophilic pneumonia, and we offer yet another case that has highly compelling evidence. Physicians must be able to recognize this medical condition in their clinical practice, because ustekinumab is being used more frequently as an immunosuppressive agent.

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MICHIGAN CLINICAL VIGNETTE POSTER FINALIST - Osama Abdel-Hafez, MD

Hemorrhagic Shock following Cardiopulmonary Resuscitation – let's not forget Internal Mammary Artery laceration.

Authors: Osama Abdel-Hafez MD, Swathi Muthyam Mogulla MD, Justin Field MD, Yashwant Agrawal MD, Michele Degregorio MD FACC.

Introduction: Cardiopulmonary resuscitation (CPR) is a lifesaving intervention that is commonly associated with rib fractures. This can lead to vascular injuries with resultant severe bleeding and shock. Timely identification of these injuries is crucial to patient's management. We herein present a case of hemorrhagic shock from a Right Internal Mammary Artery (RIMA) injury due to rib fractures incurred during CPR.

Case Presentation: A 75 year old gentleman with a past medical history of Coronary Artery Disease (CAD) status post coronary artery bypass grafting in 1996, cerebrovascular accident and leukemia presented to the Emergency Department (ED) following a resuscitated Ventricular Fibrillation (Vfib) cardiac arrest. Patient developed chest pain followed by collapse. CPR was initiated and he was found to be in Vfib. He was defibrillated twice with return of spontaneous circulation after 3 minutes of CPR. On arrival to the ED, the patient was severely hypotensive and bradycardic. Electrocardiogram revealed ST elevations in the anterior precordial leads consistent with anterior ST segment elevation Myocardial Infarction with likely cardiogenic shock. Heparin and pressors were initiated followed by emergent cardiac catheterization. He successfully underwent percutaneous coronary angioplasty with stenting of 90% occluded ostial left circumflex artery and 80% occluded distal left main. Left ventriculography showed an ejection fraction of 15% with apical akinesis, therefore an Impella CP temporary left ventricular support device was placed. The patient was then admitted to the Cardiac Care Unit where Eptifibatide and Heparin drips were continued. On admission day 2, the patient developed acute anemia, worsening hypotension, and hypoxia. Chest X-ray revealed complete right hemithorax opacification suspicious of right hemothorax. Emergent tube thoracostomy was performed with immediate drainage of 1.5 liters of sanguineous fluid. Patient underwent massive transfusion of multiple blood products, however he continued to have large volume sanguineous drainage, and therefore emergent exploratory thoracotomy was performed. This showed copious amount of clots in the pleural space, and bleeding from the undersurface of right parasternal area with laceration of the RIMA. The lacerated artery was doubly clipped and repaired. A terribly fractured sixth rib was resected and moderately fractured seventh rib was plated. Unfortunately, the patient developed Disseminated Intravascular Coagulation and despite multiple transfusions, he succumbed to his illness and expired.

Discussion: Effective chest compressions are indispensable to a successful CPR. Rib fractures are a common complication which may lead to vessel injury resulting in severe hemorrhage with formation of intrathoracic hematomas compressing the heart or lung, and can progress to hemorrhagic shock. This is further complicated by the need for systemic anticoagulation and dual antiplatelet therapy in patients with cardiac arrest secondary to Acute Coronary Syndromes. One should maintain a high index of suspicion for vascular complications of CPR in patients with persistent shock and anemia despite adequate resuscitation and support.

MINNESOTA CLINICAL VIGNETTE POSTER FINALIST - Dhauna Prasad Karam C M Prasad, MD

Primary care physician: the backbone of the world of medicine:

Authors: Dhauna Karam, MD

Introduction: In today's world, as medical conditions get complex and patients see multiple specialists, there is a common tendency to skip seeing a primary care physician. As an early career physician, I am writing this case to emphasize the important role a PCP plays in patient care.

Case Presentation: 79-year-old man, presented to our office, with complains of extreme fatigue, lower extremity weakness, shortness of breath, dysphagia, and hoarseness of voice ongoing for past 6 weeks. He had intermittent diarrhea and 22 pound unintentional weight loss. Patient also reported unsteady gait and 3 falls during this time. PMH was significant for ischemic cardiomyopathy (EF 25%), COPD, Type II diabetes mellitus and chronic kidney disease. Prior to coming to our office, patient was evaluated in ER for similar symptoms; acute coronary syndrome and infections were ruled out. Patient was discharged home with cardiology follow up. Patient was seen in cardiology clinic and unsteady gait was thought to be secondary to amiodarone use, which patient was on for history of ventricular tachycardia. Amiodarone was discontinued. Generalized weakness was attributed to cardiac cachexia and beta blocker use. Dose of beta blocker was reduced and patient was scheduled to undergo cardiac resynchronization therapy for heart failure with reduced ejection fraction. Patient was also referred to neurology for evaluation of progressive lower extremity weakness.

Patient was seen in Neurology clinic. EMG revealed mild myopathy and peripheral neuropathy. A differential of a primary gait disorder with possible hereditary peripheral neuropathy and statin induced myopathy was considered. Statin was discontinued. CT head was obtained to rule out subdural hematoma as a cause of gait instability and was normal. Patient was referred to a neuromuscular specialist for further evaluation.

In the interim, patient presented to our office for a regular 6 month follow up visit. After obtaining detailed history, a complete physical exam was performed, which revealed thyromegaly. Though thyroid function was normal 2 months ago, considering patient's constellation of symptoms, a repeat TSH was obtained, which was less than 0.01mIU/L. Free T4 was elevated at 7.8 ng/dl. Thyroid storm was diagnosed and patient was admitted to inpatient unit. Patient received intravenous fluids and oral methimazole. Further workup of thyrotoxicosis revealed elevated total T3 319 ng/dl, free T3 9.1 pg/ml, markedly elevated urine iodine/Cr ratio of 4686, negative thyrotropin receptor Ab. Thyroid ultrasound revealed diffusely enlarged thyroid and NM thyroid scan revealed homogeneous radiotracer uptake. With history of amiodarone use, patient's presentation was consistent with amiodarone-induced thyrotoxicosis (likely Type II). Patient's thyroid function improved while on methimazole and prednisone. His symptoms resolved and he is doing well with ongoing thyroid suppression.

Discussion: Our case emphasizes the significance of providing wholesome coordinated care and highlights the value of primary care visits.

NEVADA CLINICAL VIGNETTE POSTER FINALIST - Heather Boakye, MD

Lung Cavities and A Brain Abscess. A classic presentation of Norcardiosis.

Authors: Heather Boakye, MD, Kush Modi, MD, Jeremy Kilburn, MD

Introduction: Nocardiosis is a rare disease and is found ubiquitously in the environment, and commonly affects immunocompromised persons. Nocardia's innate pathogenesis allows it to disseminate quickly involving multiple organ systems. Medical management and treatment is prolonged and may require several antibiotics including Trimethoprim-Sulfamethoxazole.

Case Presentation: A 22 year old female with a history of astrocytoma on chemotherapy and chronic glucocorticoid therapy presented with hemoptysis and seizures. Laboratory data was unremarkable except for a leukocytosis of 15.6. CT imaging of the brain showed a new brain mass. CT imaging of the chest showed multiple cavitary lesions. The patient was started on broad spectrum antibiotics: Piperacillin-Tazobactam, Trimethoprim-Sulfamethoxazole, Vancomycin, and Voriconazole. MRI of the brain was consistent with a brain abscess. Patient underwent flexible bronchoscopy with bronchoalveolar (BAL) as well trans-bronchial biopsies. BAL culture grew *Nocardia farcinica*. Histology results were negative for any malignant or granulomatous process but showed filamentous organisms. Patient's hemoptysis and seizures resolved quickly and she was discharged on Amikacin, Trimethoprim-Sulfamethoxazole, and Meropenem.

Discussion: Nocardia is a gram-positive filamentous, aerobic bacteria under the *Actinomyces* species. It is found ubiquitously and can be transmitted by inhalation of dust particles [2]. Nocardia is an opportunistic organism which causes significant disease in immunocompromised patients, more specifically in those with impaired cell-mediated immune response. Risk factors include chronic glucocorticoids, malignancy, organ transplant and HIV. Nocardia disseminates quickly and usually involves more than two organ sites (32% of cases); commonly affecting the pulmonary (39%) and central nervous systems (CNS) (44% of cases with systemic infection and 9% with only CNS disease) [1]. Diagnosis requires isolation of the organism from a clinical specimen, which can be challenging as this necessitates an invasive procedure and recovery of *Nocardia* in the laboratory is difficult. First line therapy for Nocardia should include Trimethoprim-Sulfamethoxazole and with severe disease, combination therapy is recommended for at least six weeks followed by six to twelve months of oral antibiotics [4]. Surgery is recommended if a patient fails medical or antibiotic treatment [5]. Nocardiosis should be suspected and empirical therapy should be initiated prior to confirmation in patients with both pulmonary and CNS lesions especially in those who are immunocompromised [3].

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NEW JERSEY CLINICAL VIGNETTE POSTER FINALIST - Cynthia Vuittonet, MD

The effects of platelet rich plasma, medical honey, and matrix wound dressings in a chronic non healing Cesarean section wound.

Authors: Cynthia L. Vuittonet MD, Robert S. Aaron MD

Introduction: Platelet Rich Plasma (PRP) has been used in the treatment of tendonitis, osteoarthritis, skin grafting, and chronic wounds. Medical honey has been used to treat burns, diabetic foot ulcers, and chronic non healing wounds. This case report describes the role of using PRP, honey, and matrix wound dressings (Iodaform packing) to heal a chronic non healing Cesarean section (C-section) wound in an otherwise healthy patient.

Case Presentation: A 27 year old woman presented to the office with a C-section wound that persisted for six months. Her prenatal and postpartum course were uncomplicated until she lifted her daughter causing a wound dehiscence. The patient was not a candidate for secondary closure and was initially managed with daily Iodaform packing.

Physical exam revealed an obese young woman, stable vital signs, and two wounds each measuring 0.2cm in width, 0.1cm in length, and 4.5cm in depth. Culture of each wound revealed heavy growth of Group B Streptococcus. After a week of oral antibiotics (cephalexin) and iodaform packing, depth of each wound decreased to 2.5cm. Subsequently, there was no further improvement in the wound depth and repeated cultures were negative.

The patient underwent a treatment of PRP. In the office, 5mL of blood was drawn into a red top BD Vacutainer Serum Tube. The tube was centrifuged and PRP was separated using a sterile spinal needle. Iodaform packing was saturated with PRP and placed in the wound. One week later depth of wound was 1cm.

After two weeks, there was no further improvement wound depth. To optimize the wound bed and healing, medical honey was added to the patient's regimen. The Iodaform packing was saturated with medical honey and packed into the wound. After one week, the wound closed.

Discussion: C-section deliveries represent 31.9% of all US births, and dehiscence can occur in 4-30% of all C-sections. There are some studies that suggest obesity is a major risk factor for C-section dehiscence. There are many options for treatment of dehiscence, which include wet to dry dressings, packing, negative pressure therapy, and secondary closure. There are limited studies using PRP and honey in C-section wound dehiscence.

PRP is a concentration of activated platelets, and compared to whole blood, has a 3 to 8 fold increase in autologous growth factors. In a limited number of clinical trials, PRP stimulates skin and cartilage regeneration. Research has shown that medical honey has antibacterial, anti-inflammatory, and pH optimizing properties which aid in wound healing. This case highlights the future of in office treatment with PRP, medical honey, and matrix wound dressings to treat wound dehiscence in c-section patients. Identifying patient's at greatest risk for complications and prompt management of wound dehiscence can dramatical decrease time to heal and improve quality of life.

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NEW YORK CLINICAL VIGNETTE POSTER FINALIST - Apoorva Jayarangaiah, MD

Beware the superwarfarin in K2; A case of brodifacoum laced synthetic marijuana induced coagulopathy and bleeding

Authors: Apoorva Jayarangaiah MD; Pramod Theetha Kariyanna MD

Introduction: Brodifacoum belongs to the class of superwarfarins which are vitamin K antagonists about 100 times more potent than warfarin. Inadvertent or intentional poisoning and most recently contaminated synthetic marijuana has led to severe coagulopathy. Brodifacoum laced synthetic marijuana induced coagulopathy were first reported as an outbreak of more than 150 cases in Illinois in 2018. We hereby present a case of a 58-year-old male who presented with gross hematuria and later developed hemoptysis following synthetic marijuana use one month prior to admission.

Case Presentation: A 58-year-old M with history of Hepatitis C presented with left-sided flank pain and gross hematuria of 2-day duration. The patient reported progressively worsening sharp left sided flank pain of moderate severity. He denied fevers or dysuria. He is a former smoker but denied drug use. Physical examination was notable for stable vital signs and left costovertebral angle tenderness. Labs on admission were significant for Hemoglobin of 10.4 mg/dL, platelets of 204 x 10^9/L, BUN of 36 mg/dL and serum Cr of 3.06 mg/dL. Liver function tests were within normal limits. CT abdomen/pelvis showed bilateral hydronephrosis with bilateral 3 mm stones in the ureters. The patient underwent bilateral ureteral stent placement. On Day 2 of hospitalization, the patient complained of hemoptysis. ENT evaluation revealed active bleeding from a small hematoma with posterior pharynx edema. The patient was transferred to the MICU and started on dexamethasone. Hemoglobin dropped from 9.8 to 7.1. Serum creatinine improved to 1.36 mg/dL however gross hematuria persisted. Coagulation labs were significant for PT >100 seconds, aPTT 120 seconds, INR 10. Platelets remained normal at 204 x 10^9/L. The patient received 2 units of fresh frozen plasma and 1 unit of packed red blood cells. Factors II, VII, IX, X were all decreased. Upon further questioning, the patient admitted to synthetic K2 marijuana use 30 days prior to presentation. Brodifacoum level was elevated at 150 ng/mL (Reporting limit:10 ng/mL). IV Vitamin K was initiated and transitioned to 100 mg of PO Vitamin K daily. Following improvement of PT and INR, the patient was discharged on Vitamin K PO 25mg BID. He was followed up in clinic with subsequent PT/INR and brodifacoum levels until normalization.

Discussion: Brodifacoum is a highly potent vitamin K antagonist with a half-life of at least 16 days. Brodifacoum laced synthetic cannabinoids are thought to augment and prolong the effects of the drug. Reports of brodifacoum poisoning have presented as severe bleeding. Gross hematuria is the most common presentation. The diagnosis was made due to the presence of Vitamin K dependent factor coagulopathy, synthetic marijuana exposure, and active bleeding. Vitamin K is the mainstay of therapy. Due to prolonged half-life, vitamin K is continued for at least one month with close monitoring of PT/INR and brodifacoum levels.

NORTH CAROLINA CLINICAL VIGNETTE POSTER FINALIST - Sindhuja Marupudi, MD

Don’t always blame CREST Syndrome for heart problems

Authors: Sindhuja Marupudi, MD, Ariel S Frost MD, Suma Menon MD.

Introduction: Arrhythmogenic right ventricular cardiomyopathy (ARVC) is a non-ischemic cardiomyopathy predominantly affecting the right ventricle (RV) that leads to ventricular arrhythmia, sudden cardiac death, and heart failure. ARVC should be suspected in patients with RV cardiomyopathy without evidence of ischemia or pulmonary hypertension.

Case Presentation: A 43-year-old Caucasian male with history of limited cutaneous systemic sclerosis (lcSSc),CREST syndrome, chronic back pain, and bilateral hip replacements, presented after a witnessed convulsive syncopal episode. He reported no prior history of seizures, syncope,palpitations, or chest pain.His family history was notable for cardiac disease with cardiac stenting before 50 years and SCD.

In the emergency department he was tachycardic to 101 and the initial workup was negative for MI, pulmonary embolism, and intracranial hemorrhage.
An EKG revealed normal sinus rhythm (NSR), premature atrial contractions, and prolonged QTc(518 ms).Physical exam was positive only for sclerodactyly and calcinotic depositions on the fingers and elbows bilaterally.MRI of the brain was negative. EKG revealed normal sinus rhythm with premature atrial
contractions and T-wave inversions in V1-V4 with QTC 482.Continuous telemetry was not able to capture any arrhythmia or prolonged QTc during the
hospitalization.Echocardiogram was only positive for reduced RV sytolic function with normal LVEF 55-60.

The differential at this point of time for syncope was ischemia given the family history of SCD from coronary artery disease, arrhythmia and RV dysfunction given the history of CREST syndrome, and arrhythmogenic right ventricular cardiomyopathy (ARVC) given the TTE findings which showed dilated RV and hypokinetic basal segments.

Cardiovascular magnetic resonance (CMR) showed severely dilated RV with RVEF 20%. There is late gadolinium enhancement of the RV free wall
consistent with fibrosis worrisome for a RV cardiomyopathy and also evidence of LV dysfunction(LVEF 45%). Cardiac catheterization revealed mild coronary artery disease with normal pulmonary pressures. He met the criteria for ARVC (Global RV dyskinesia,Ratio of RVEDV to BSA: 145 mL/m2,RVEF 19%,Inverted T waves in V1-V4).

Due to the patient’s high risk for sudden cardiac death (SCD), a single chamber ICD was placed for primary prevention. The patient was advised to inform family members of the diagnosis to receive appropriate screening.

Discussion: ARVC is a type of non-ischemic cardiomyopathy with an incidence of 1 in 2000 to 1 in 5000, diagnosed aound 30 years of age with 30% of cases being familial.It is an inherited disease caused by multiple mutations on genes encoding for desmosomal proteins causing mycocyte death and fibrofatty replacement of RV myocardium.

Ventricular arrhythmias in ARVC can be exercise-induced originating from RV which could range from PVCs to sustained ventricular tachycardia.Diagnosis is made by Revised Task force Criteria(RV dysfunction and structural abnormalities,biopsy,depolarisation and repolarisation abnormalities on EKG,arrhythmias and family history).

There is no known curative treatment for ARVC. Early diagnosis is important to prevent SCD with an ICD.

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OHIO CLINICAL VIGNETTE POSTER FINALIST - Pierre El Hachem, MD

Baby Paul is spreading the smiles

Authors: Pierre El Hachem, MD

Introduction: Complementary therapies (music, reiki, massage, aromatherapy, mindfulness) and animal-assisted therapy has shown a role in alleviating pain and providing comfort to patients with serious illnesses.

To date, there is limited data or literature available with regard to feasibility, therapeutic indications and efficacy of “Baby Therapy” in palliative care.

Case Presentation: I am a medical director of a hospice practice that has a 10 beds inpatient facility. The facility is 60 miles away from my residence. On average, I round on patients 2 days a week and the rest of the visits are performed by a nurse practitioner. Ten months ago, I had my first baby and due to time restraints, I was not able to find enough time to spend with him. Once the baby became one month old, I and my wife decided to go altogether to the hospice facility once a week. While there, I noticed the huge impact Baby Paul had on the staff by bringing happiness and joy. I then decided that Baby Paul makes room visits with me after taking consent from patients/families. The goal was simply placing a “smile” on their faces. The results were incredible despite what the patients were going through. Excluding those with active infections, and/or history of multidrug resistant infections, Baby Paul would sit on the patients’ laps for an average of 5 minutes if applicable. On my next visit, patients/families would ask me why the baby is not with me before bringing up their symptoms that I need to address.

Discussion: “Baby Therapy” may constitute a valuable and practicable adjunct to the interdisciplinary therapeutic repertoire of palliative care in a hospice facility setting. More robust study designs are required to assist in establishing such an intervention

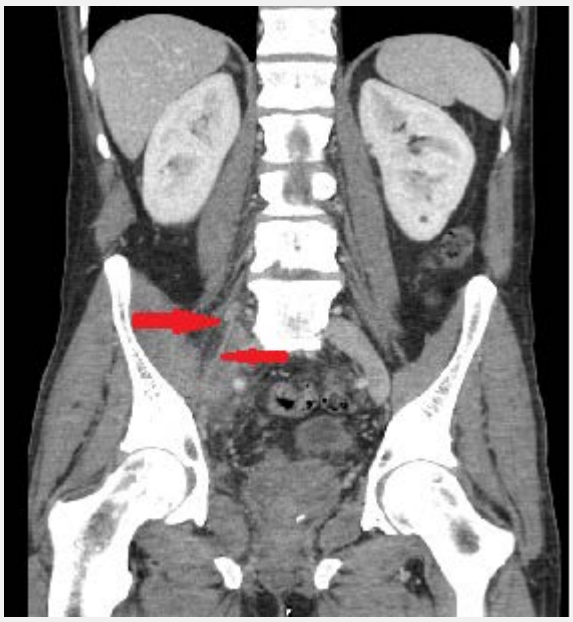
PENNSYLVANIA CLINICAL VIGNETTE POSTER FINALIST - Reshma Golamari, MD

Septic Pulmonary Emboli From Common Iliac Vein Thrombosis Caused By Anaerobic Bacteria.

Authors: Reshma Golamari, Shengnan Zheng, Melissa Alvarez, Priyanka Bhattacharya

Introduction: Lemierre's Syndrome is described traditionally as an infectious thrombophlebitis of the Internal Jugular veins. However, uncommon variants have been described such as gynecological variant and a gastrointestinal (GI) variant. We present one such uncommon variant of septic thromboplebitis arising from GI tract

Case Presentation: 59 year old African-American Male with past medical history of cerebrovascular accident presented to the emergency department with complaints of pain and swelling of the right leg since 2 weeks. He associated chills and weight loss. His vitals at presentation were a heart rate of 109, blood pressure of 118/84 mmHg, respiratory rate of 16, temperature of 98.1. Physical examination revealed an erythematosus and warm right leg. Venous ultrasound showed an extensive thrombosis from the femoral vein through the right popliteal vein. A Computerized Tomography (CT) abdomen done to evaluate the extension revealed an extension into right common iliac vein. Heparin drip was started and an inferior vena cava filter was placed given the extension. After admission, the patient had a temperature of 102.9 and had a lactate of 2.3, so blood cultures were ordered and no antibiotics were started since the source of infection was unknown. With a suspicion of pulmonary embolism (PE) with such an extensive clot burden, CT chest done showed a tiny subsegmental PE. The blood cultures on day 5 after collection grew Fusobacterium Necrophorum (NF). Infectious diseases were consulted and they recommended Metronidazole. Interventional radiology performed pharmacomechanical thrombectomy of the right common iliac to the popliteal vein with stenting of the right common iliac vein. The patient denied sorethroat or recent appendicitis to explain bacteremia with NF in the blood. The only reasonable explanation is was that the bacteria that colonized the gastrointestinal tract migrated to the common iliac veins because of the close proximity and even caused septic emboli in the lungs. The patient received 14 days of Metronidazole and repeat blood cultures were negative. The patient was eventually discharged on Warfarin.



Discussion: NF is an anaerobic gram negative bacteria which is normally colonized in the pharyngeal, gastrointestinal or genitourinary tracts. Our patient had a gastrointestinal source of origin which resulted in the migration of bacteria to the common iliac veins causing stasis and a subsequent deep venous thrombosis.

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PENNSYLVANIA CLINICAL VIGNETTE POSTER FINALIST - Jessica Gold, MD PhD

A Newborn Screen for Adults? Diagnosing Inborn Errors of Metabolism through Direct-to-Consumer Genetic Testing

Authors: Jessica I Gold MD/PhD, Zoe Bogus MGC, Anna Raper MGC, Staci Kallish DO

Introduction: Genetic testing has exploded in recent years. Direct-to-consumer genetic testing (DTC-GT) has arisen to meet this interest. Initially marketed as ancestry services, increasing demand has led to the inclusion of more extensive genetic testing. Companies, such as 23andMe, now offer carrier screening for genetic diseases, such as cystic fibrosis and sickle cell anemia. Despite the popularity of DTC-GT, providers lack knowledge to discuss genetic testing results. This is especially true for adult patients who are diagnosed with pediatric diseases through DTC-GT.

We present two families referred for genetic evaluation based on their DTC-GT results. Through buccal swabs collected at home, these families received a new diagnosis of an inborn error of metabolism. Inborn errors of metabolism are traditionally considered diseases of infancy and childhood. They are usually identified on the newborn screen, a state-regulated blood test performed in the first 48 hours of life. However, DTC-GT has created a new venue for diagnosing these rare diseases.

Case Presentation: Case 1: Patient KT is a previously healthy 23-year-old female. Her family decided to complete 23andMe testing together. Both of her parents were reported to be carriers of Medium Chain Acyl-CoA Dehydrogenase (MCAD) deficiency. Confirmatory genetic testing of KT determined that she has MCAD deficiency. This deficiency prevents catabolism of medium chain fatty acids and leads to hypoketotic hypoglycemia during periods of fasting or stress. Reye-like episodes of acute hepatic failure can lead to coma and death. Children are especially at risk during episodes of viral gastroenteritis. Further exploration of KT's history revealed a pattern of shakiness, confusion, and pre-syncope following fasts lasting 6-8 hours. Luckily, she experienced no metabolic decompensations during childhood and is currently a working as a nurse.

Case 2: CB presented to medical genetics after her son learned that he had Fabry disease on preconception carrier screening. Fabry disease is an X-linked lysosomal storage disease due to the accumulation of globotriasoylcermide. Fabry disease can present with acroparesthesias, abnormalities in sweating, and angiokeratomas. End-stage renal disease can occur in the third decade of life and patients are predisposed to cardiac and cerebrovascular disease. At the time of diagnosis, CB was being treated for multiple sclerosis due to acroparesthesias and abnormalities seen on brain MRI. However, on re-evaluation, CB's symptoms were attributed to Fabry's disease. CB's son was found to have left ventricular hypertrophy on initial evaluation. He was started on enzyme replacement therapy with stabilization of his cardiomyopathy.

Discussion: DTC-GT is a growing entity in the health marketplace. This testing can lead to novel presentation of rare diseases. Physicians should be aware that patients are increasingly using these services. They also need to be prepared to counsel about diseases previously relegated to the pediatric realm.

PENNSYLVANIA CLINICAL VIGNETTE POSTER FINALIST - Deborah Kahal, MD, FACP

A case report of new onset type 2 diabetes during hepatitis C treatment with elbasvir/grazoprevir

Authors: Deborah Kahal, Chris James, Susan Szabo

Introduction: While HIV protease inhibitors (PIs) have a well-established association with increased risk of insulin resistance and type 2 diabetes (DM2), [1,2,5] there are few reports of the same with hepatitis C virus (HCV) direct-acting antivirals (DAAs), including HCV PIs.[6] Rather, there is evidence that HCV treatment and cure with DAAs results in improved glycemic control in patients with DM2 and pre-diabetes.[7-9] Between January 2016 and July 2017, our program treated 45 patients with HCV mono-infection or HIV/HCV co-infection with elbasvir/grazoprevir, a single tablet regimen including a HCV PI.[3] We report a compelling case of new-onset DM2 during treatment with elbasvir/grazoprevir that resolved after DAA completion.

Case Presentation: A 55 year old, obese (BMI 31), African American male with chronic HCV (genotype 1b, HCV fibrosure F3), non-ischemic bi-ventricular heart failure, atrial fibrillation, alcohol use and tobacco dependence presented for HCV evaluation. Non-fasting glucoses ranged from 86-117mg/dL in the 2 years prior to HCV treatment. The patient, without family history of DM2, adhered to a stable medication regimen including atorvastatin and furosemide and did have metabolic syndrome. In January 2017, he initiated a 12 week course of elbasvir/grazoprevir for HCV treatment. 4 weeks later, he developed acute-onset polydipsia and blurry vision with a glucose of 795 mg/dL, meeting criteria for new-onset DM2.[4] Complete blood count and metabolic panel, urine drug screen, cardiac enzymes, electrocardiogram and chest radiograph were normal, HCV RNA was undetectable, and hemoglobin A1c (HbA1c) was 9.4%. The only medication change was a pharmacy-confirmed dose reduction of atorvastatin while on elbasvir/grazoprevir. Throughout HCV treatment, his weight and diet remained stable and alcohol usage decreased.

Following DM2 diagnosis, he started glipizide and metformin with rapid dose escalation to 1g twice daily. 8 weeks into taking elbasvir/grazoprevir, his HbA1c peaked at 13.6% and he started insulin glargine with a maximum required dosage of 50 units daily. At the time of DAA completion in April, his HbA1c was 11.1%, glipizide was stopped, metformin reduced to 1g daily and insulin decreased to 30 units daily. 2 months following HCV treatment, HbA1c decreased to 6.5% and insulin was discontinued. 3 months after DAA completion, HCV cure was confirmed and HbA1c remained stable at 6.0% on metformin. By August 2017, metformin was discontinued. To date, the patient remains euglycemic off all anti-glycemic agents.

The patient provided verbal informed consent for this case report. The case was submitted to the FDA and drug manufacturer as a possible adverse drug event.

Discussion: This case highlights a potential, novel association between elbasvir/grazoprevir and incident DM2. Multiple potential mechanisms for this association, including development of auto-immunity to islet cells[11] and up-regulation of interferon gene expression, [12] deserve further investigation. While current guidelines do not recommend glucose monitoring during DAA therapy,[10] it may be reasonable to reconsider this recommendation.

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PERU CLINICAL VIGNETTE POSTER FINALIST - Carlos Huauya, MD

This spirochete waits for no man: When rushing is the right choice.

Authors: Carlos Huauya-Leuyacc(1), Karyna M. Neyra (2), 1) Former Attending Physician. Internal Medicine Department. National Hospital Daniel Alcides Carrion. Callao, Peru, 2) Attending Physician. Infectious Diseases Department. Saint Barnabas Medical Center. Livingston, NJ. USA.

Introduction:Acute respiratory distress syndrome (ARDS) has different etiologies. We present an unusual case caused by a spirochete.

Case Presentation: A 27-year-old Peruvian man presented with five days of fever, malaise, weakness, myalgia, arthralgia and abdominal pain. He also had diarrhea for two days. He denied jaundice or dark urine. Worsening of his symptoms prompted his admission. The patient had no prior diseases and denied sick contacts. He worked as a pig breeder.

On initial presentation, he had fever (101.5 F) and occasional dry cough without dyspnea; his oxygen saturation was 98% in room air. There was an erythematous rash and conjunctival suffusion. No lymphadenopathy, petechiae or icterus were seen. Lungs were clear to auscultation without costal retractions. His abdomen was soft but mildly tender; slight hepatomegaly was noted. Myalgia in lower extremities was worse with palpation.

The initial laboratory data showed mild thrombocytopenia (120,000/mL) and elevation of ESR and CRP. Other biochemical tests, urinalysis and coagulation profile were normal. Chest x-ray was normal. Abdominal ultrasound demonstrated hepatosplenomegaly. Standard bacterial, fungal and mycobacterial cultures from blood, urine and stool were negative. Serology for HIV, hepatitis, HTLV-1, Salmonella, Brucella and syphilis were negative. Thick smear was negative. Serology for yellow fever, dengue, and leptospirosis were pending.

After three days, his course was complicated by worsening thrombocytopenia (98,000/mL) and mild anemia (11gr/dL) without bleeding or hemolysis. At this point, we started empiric ceftriaxone for possible leptospirosis, while waiting for results. At night, the patient had hemoptysis and became hypoxic. Chest x-ray revealed diffuse bilateral infiltrates. Labs were significant for acute anemia (9.5gr/dL) and severe hypoxic respiratory failure. The diagnosis of ARDS and diffuse alveolar hemorrhage (DAH) were made. Additional tests for influenza, hantavirus and autoimmune diseases were sent. His results became available the next day: Leptospira IgM was positive and microagglutination test (MAT) was reactive (Serovar Canicola 1/25 600 and Serovar icterohaemorrhagiae 1/12 800). ANA, ANCA, rheumatoid factor, serology for yellow fever, dengue, hantavirus and influenza were negative. The patient had a satisfactory recovery during the subsequent days.

Discussion: Leptospirosis is a widespread zoonotic infection caused by spirochetes of the *Leptospira* genus. There are nine known pathogenic species divided into serovars. Although rats are well-known reservoirs, Leptospira can infect all mammals. The serovars found in our patient are associated to infection in pigs. This illness has a wide variety of clinical manifestations and it is usually characterized by fever, rigors, myalgia and headache. Anicteric leptospirosis is usually mild and self-limited. Diffuse alveolar hemorrhage is one of the most severe complications and can be seen in icteric and anicteric forms. Implementation of empiric antibiotic therapy upon clinical suspicion is advised while waiting for confirmatory testing. A delay in treatment may have fatal consequences.

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TEXAS CLINICAL VIGNETTE POSTER FINALIST - Christina Awad, MD

A Case of Leptomeningeal Carcinomatosis in Metastatic Prostate Cancer

Authors: Dr. Christina Awad, Wilford Hall Medical Center, San Antonio, TX , Dr. Zachary Wright, Keesler Medical Center, Biloxi, MS.

Introduction: Prostate cancer is the second most common cause of cancer related death globally.[1]Leptomeningeal metastases are extremely rare and portend an ominous prognosis for which there are no treatment guidelines. We present a patient with metastatic prostate cancer who complained of bilateral chin and jaw numbness and was ultimately diagnosed with leptomeningeal carcinomatosis via dural biopsy.

Case Presentation: A 63-year old male presented to the clinic complaining of a two month history of bilateral bony leg pain. Extensive work-up revealed lesions on a bone scan concerning for osteoblastic metastatic disease. Computed tomography showed intraabdominal lymphadenopathy without other visceral disease. His PSA at diagnosis was 440 and a right prostate biopsy was positive for prostatic adenocarcinoma with a Gleason score of nine. The patient was subsequently started on standard androgen deprivation therapy (ADT) with bicalutamide and triptorelin. He was evaluated by medical oncology for consideration of denosumab where he noted bilateral chin and jaw numbness over the last few months as well. Neurological examination was notable for bilateral cranial nerve V3 numbness (numb chin syndrome). Brain MRIrevealed diffuse dural thickening and pachymeningeal enhancement. His CSF was negative for malignant cells, however, concerns remained high and he was referred to neurosurgery for dural biopsy. His biopsy revealed metastatic prostate carcinoma that was positive for PSA and PSMA, and negative for CD45, synaptophysin and TTF1. Initially, there were considerations to start patient on intrathecal chemotherapy. However; after expert consultation by a prostate cancer specialist, it was decided that ADT would be sufficient as the sole treatment for both bone and leptomeningeal metastases. This represents a rare case of prostate cancer with leptomeningeal carcinomatosis highlighting the difficulties encountered in diagnosing and treating this disease complication.

Discussion: Prostate cancer can metastasize to the leptomeninges hematogenously or lymphatically from adjacent skeletal metastases.[2]Recent advances in systemic therapy prolong patients' lives and may increase the incidence of leptomeningeal involvement. Unfortunately; thereare no current guidelines or consensus among specialists on treatment strategies for leptomeningeal metastases. Therapies such as intrathecal chemotherapy, radiotherapy, surgical debulking, and corticosteroids have been documented with generally poor results.[3]ADT has been the initial standard of care for metastatic prostate cancer. In a case reported by Mencel et al, a patient with prostate cancer and leptomeningeal metastases was treated with ADT and resulted in a 16 month survival.[4]Our patient was started on ADT, and to date has not developed any further neurological symptoms.

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TEXAS CLINICAL VIGNETTE POSTER FINALIST - Gangamma Chenenda Prabhu, MD, MPH

AN UNUSUAL CAUSE OF CONFUSION AND MENTAL FATIGUE: A CASE OF NEUROBRUCELLOSIS

Authors: Gangamma Chenenda Prabhu, MD, MPH; Rohan Chaubey, MD; Jaini M. Sutaria, MD, UT Southwestern Medical Center, Dallas, Texas.

Introduction: Brucellosis is a zoonosis that presents with non-specific symptoms of fever, sweats, fatigue, anorexia, and weight loss. It occurs due to consumption of unpasteurized milk and milk products or by direct contact with infected animals. It is most commonly seen in the Mediterranean countries, Middle East, India, Mexico, South and Central America but is now also being seen in developed countries as a travel related illness. [1,2,4]

Case Presentation: A previously healthy 48 year-old Guatemalan male presented with malaise, anorexia, 20-pound weight loss. Three weeks prior, he had fever, chills, emesis and diarrhea. A thorough history revealed intermittent confusion with labile, tearful mood swings. Lab-work confirmed pancytopenia, hyponatremia and mild transaminitis. Abdominal ultrasound showed hepatosplenomegaly. MRI brain showed “Interval development of diffuse pachymeningeal thickening and enhancement”. Patient had similar presentation two weeks prior and at that time MRI was unremarkable. Son disclosed that the patient had consumed unpasteurized goat cheese three months prior to the onset of symptoms and coworkers had similar symptoms. Patient was started on empirical treatment for Brucellosis with Doxycyline and Rifampicin. His depressed mood and neurologic changes were suspicious for Neurobrucellosis, so Ceftriaxone was added to the above regimen. Blood Cultures were positive for Brucella melitensis. Brucella Antibody was positive. RPR was negative. CSF showed 11 RBC, 3 nucleated cells, no organisms on culture. His neurological symptoms resolved rapidly after initiation of antibiotics. Infectious Disease recommended completing a 6 week course of Ceftriaxone, Doxycycline and Rifampicin.

Discussion: Neurobrucellosis is rare and occurs in <7% of the cases.[4] Signs and symptoms are non-specific ranging from fever, malaise, headache to behavioral changes, depression, confusion, meningeal signs, and pseudotumor cerebri. The yield for a positive CSF culture is very low (5–30 %) but serological tests like enzyme-linked immunosorbent assay (ELISA) on CSF are helpful in diagnosis. Antibiotics are the mainstay of brucellosis treatment. Rifampicin (600-900 mg/day orally) plus Doxycycline (200 mg/day orally) for 6 weeks is the preferred regimen for uncomplicated brucellosis due to lower costs and higher adherence rates.[3,4,5] It is recommended that Ceftriaxone (2g Q 12 hrs intravenously) should be added to the above regimen in Neurobrucellosis as Ceftriaxone achieves high concentrations in the cerebrospinal fluid, much higher than the MICs against Brucella.[6] As internists, we commonly admit patients with systemic symptoms and confusion. The above patient could have been easily misdiagnosed as his presentation could have been attributed to a psychiatric illness, substance abuse or a nonspecific viral illness. A high index of suspicion and a history of consumption of unpasteurized milk or milk products are crucial to diagnose neurobrucellosis. CSF and imaging findings can be normal. It is important to start empiric treatment of neurobrucellosis early to decrease morbidity and prevent neurologic sequelae. [3,4,5]

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US AIR FORCE CLINICAL VIGNETTE POSTER FINALIST - Asha De, MD

Kikuchi Disease: A Rare Cause of Lymphadenopathy in a World Traveler

Authors: Asha De

Introduction: Histiocytic necrotizing lymphadenitis, also known by the eponym Kikuchi-Fujimoto disease, is a rare, benign disorder characterized by a febrile syndrome with regional cervical lymphadenopathy. The overlap in clinical presentation with more serious causes of lymphadenopathy requires an accurate histopathological diagnosis.

Case Presentation: A 29-year-old active duty male was referred to a tertiary care center for a three-week history of painful, gradually enlarging left occipital and bilateral inguinal lymphadenopathy, fevers, and night sweats. He had completed a 10-day course of Cephalexin prior to admission with no resolution of symptoms. Review of systems was otherwise unremarkable. Travel history included military deployments to Europe, the Middle East, Central and Northeast Asia, Southwestern United States, and most recently to Korea a year prior. He denied any animal or fresh water exposure, with the only insect exposure to mosquitoes. Exam was significant for persistent fevers and multiple tender, indurated lymph nodes located in the occipital and inguinal regions, the largest approximately 2 cm in diameter. Initial laboratory and serologic testing was unrevealing. Contrast enhanced CT of the neck, chest, abdomen, and pelvis showed cervical and supraclavicular lymphadenopathy with no evidence of adenopathy by size criteria in the abdomen and pelvis. Excisional biopsy of two right inguinal lymph nodes was performed, with findings of histiocytic necrotizing lymphadenitis on pathology consistent with Kikuchi-Fujimoto's disease. Infectious workup to include bacterial, viral, and AFB tissue cultures were negative. While Kikuchi's disease has been associated with systemic lupus erythematosus, given negative ANA and lack of other symptoms, no further rheumatologic workup was performed. The patient was discharged with supportive treatment to include non-steroidal anti-inflammatory drugs for pain and fever. The patient endorsed resolution of night sweats and lymphadenopathy at a six-week follow up phone call, with occasional subjective fevers.

Discussion: This case demonstrates a rare, albeit benign, self-resolving case of lymphadenopathy in a young man with an extensive travel history. The differential for the presenting constellation of symptoms is extensive, to include more malignant causes such as lymphoma. Developing a broad differential and obtaining accurate histopathological evaluation is essential in evaluation of a patient with lymphadenopathy and fever.

US ARMY CLINICAL VIGNETTE POSTER FINALIST - CPT Caleb Anderson, MD

Antisynthetase Syndrome with Anti-PL12 and Anti-Ro52 Positivity– A Case Series of a Distinct Clinical Phenotype

Authors: Caleb W. Anderson, MD, CPT, MC, USA; Hector A. Medina, MD, CPT, MC, USA; Robert O'Brian, MD, CDR, MC, USN; Collamer, Angelique, MD, Lt Col, USAF, MC

Introduction: Antisynthetase syndrome is a rare autoimmune disease spectrum characterized by variable expression of myositis, interstitial lung disease (ILD), arthritis, Raynaud's phenomenon, and distinctive cutaneous findings. The hallmark serologic feature of the disorder is the presence of myositis specific autoantibodies (MSA) directed against an aminoacyl transfer RNA (tRNA) synthetase.[1] The most common tRNA synthetase antibody is anti-Jo1, which has been associated with higher prevalence of muscle and joint involvement.[2] The clinical phenotypic profile of anti-PL12 has not been as well established, although recent literature suggests its presence may predict a very high chance of ILD and a lower incidence of myositis and arthritis. The concomitant presence of a group of autoantibodies designated myositis associated antibodies (MAA) has been proposed to have prognostic ramifications. The most common MAA in antisynthetase syndrome is anti-Ro52. In patients with co-expression of anti-Jo1 and anti-Ro52, a clinically distinct syndrome characterized by arthritis, myositis, and ILD has been described.[3] The clinical phenotype of concomitant anti-PL12 and anti-Ro52 positivity has not been well described in the literature.

Case Presentation: We present six cases of anti-PL12 positive patients. Two of the patients were positive for anti-Ro52 via enzyme-linked immunosorbent assay (ELISA). The other four were positive for anti-Ro via multiplex flow immunoassay. Skin findings included Gottron's sign, Gottron's papules, heliotrope rash, and mechanic's hands. Severe gastric reflux was present in four patients, arthritis was present in five, and ILD was present in all patients. Proximal muscle weakness was documented in five patients, and elevated creatine kinase (CK) was noted in five out six patients (83%) with a mean CK level of 1,743 U/L (range 251 U/L – 7264 U/L).

Discussion: Although the number of reported cases is relatively small, literature suggests lower rates of myositis in anti-PL12 patients. Clinically, amyopathic dermatomyositis and isolated ILD presentations have been most described. Anti-PL12 patients have reported rates of myositis between 19% and 41%.[4-6] Our series demonstrates clinically significant myositis in 83% of the patients with an elevated mean CK level. All patients in our series developed ILD, which is a higher rate than is seen with PL-12 positivity alone. This preliminary data suggests that concomitant anti-Ro52 and anti-PL12 positivity predicts a distinct clinical phenotype of antisynthetase syndrome characterized by increased incidence of ILD and myositis with higher mean CK levels. Based on our experience, we recommend that anti-Ro52 should be measured in all anti-PL12 positive patients with antisynthetase syndrome. Further descriptive studies are necessary to elucidate the precise clinical phenotype and response to treatment regimens in this unique patient population.

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US ARMY CLINICAL VIGNETTE POSTER FINALIST - CPT Hector A Medina, MD

Cold Iron: Muddying the Waters of Cardiac Sarcoidosis

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Introduction: Sarcoidosis is a multisystem disease of unknown etiology in which a dysfunctional cell-mediated immune reaction leads to non-caseating epithelioid granulomas. Cardiac involvement can be deadly and often requires chronic immunosuppressive therapy. Patients with cardiac sarcoidosis are reported to have an increased risk for severe infections, a risk that is augmented by the immunosuppressive therapy needed to control the disease. We present a challenging case of a rare infection in a patient with active and severe cardiac sarcoidosis.

Case Presentation: A 61 year old African-American woman with a history of cardiac sarcoidosis presents with four weeks of malaise, fevers, rash, and painful swelling of the right knee and left wrist. Her cardiac sarcoidosis was diagnosed fifteen months earlier, after she presented with complete heart block requiring urgent pacemaker placement. Twelve months later, ongoing disease activity on cardiac positron emission tomographic (PET) scan prompted a regimen of prednisone, methotrexate, and infliximab. After three months on this regimen, she developed malaise, fevers, a pustular rash of her upper extremities and chest, and a diffuse erythema nodosum-like rash of her lower extremities. Arthrocentesis of the right knee revealed an effusion with 19,750 white blood cells, but negative gram stain and cultures. Initial skin biopsy was negative, but repeat biopsy revealed granulomatous dermatitis with caseating necrosis and thin filamentous organisms with a beaded morphology on a Ziehl-Neelsen stain. Immunosuppressive therapy was held. Further history revealed a Caribbean cruise vacation 3 months earlier, where she underwent acupuncture treatment, immediately followed by bathing in natural springs of volcanic mud. Empiric antimicrobial therapy was limited by a lack of positive culture data, but molecular sequencing of the skin biopsy revealed Mycobacterium haemophilum as the cause of her disseminated infection. After five months of quadruple antimicrobial therapy, she felt well and stopped developing new skin lesions, however, the original skin lesions remained and she had persistent inflammatory arthritis of the knee despite two surgical debridements. A repeat PET scan was mildly positive for pulmonary sarcoidosis, but cardiac disease was quiescent. A multidisciplinary decision was made to complete at least twelve months of antimicrobial therapy while holding immunosuppressive therapy, unless cardiac disease relapsed on cardiac PET scan surveillance every three to six months.

Discussion: Infections due to M. haemophilum are rare but increasingly recognized in immunocompromised populations. Its specific incubation requirements of cold temperature and iron enriched media often make it elusive; a stark contrast from its prominent and diverse cutaneous and musculoskeletal disease manifestations. Molecular sequencing is helpful in diagnosis, but not widely available. At least one year of multidrug therapy is usually required, and it is often complicated by concurrent need for immunosuppressive therapy. Being aware of the intricacies of these atypical infections is important for any clinician caring for the immunocompromised patient.

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VIRGINIA CLINICAL VIGNETTE POSTER FINALIST - Patrick Fadden, MD

Extraintestinal Rheumatologic Manifestations of Crohn's Disease ...or Treatment?

Authors: Patrick Fadden MD, Ahbi Nandan MD

Introduction: With the increase use of TNF inhibitors, providers must be aware of potential adverse effects. Among these, drug-induced lupus is rare and a challenge to diagnose as the clinical features often overlap with features of the primary disorder. Presented is a case of acute inflammatory polyarthritis in a patient with Crohn's disease on infliximab and an illness script with features similar to extra-intestinal Crohns manifestations but most consistent with drug-induced lupus.

Case Presentation: A 35 y/o male veteran being treated with infliximab for non-fistulizing ileocolonic Crohns disease presented to the emergency room experiencing 3 hours of severe central pleuritic chest pain. Infliximab was started 6 months prior with plans to increase the dose due to elevated anti-infliximab antibodies. On evaluation, he also reported two weeks of bilateral, ascending polyarthropathy progressing from the ankles and knees to bilateral hands and wrists in the past 3 days. There was no past history of inflammatory arthritis. He was taking no other medications and his social history was only noted for occasional alcohol use. Physical exam was pertinent for a 3/6 systolic cardiac friction rub, bilateral wrist flexor tenosynovitis, and bilateral ankle joint synovitis. There was no oral ulceration or alopecia. Dermatologic exam revealed no rash. Abdominal exam was benign. His abnormal laboratory findings included a neutrophil predominant white blood cell count of 13.3 g/dL, normochromic normocytic anemia (Hgb 13.1g/dL), c-reactive protein of 6.89 mg/dL, and urinalysis consisting of 100 mg/dL of protein without blood. An EKG was performed which showed diffuse ST segment elevation with reciprocal PR depression concerning for pericarditis. Further immunologic workup revealed an anti-nuclear antibody 1:640 homogenous pattern, elevated double-stranded DNA antibody (9 IU/Ml), elevated histone antibody (1.3U; weakly positive). Rheumatoid factor and Anti-CCP were normal. Serum complement levels were within normal limits.

Discussion: Axial and oligoarticular inflammatory arthritis comprise the majority of extraintestinal rheumatologic manifestations of inflammatory bowel disease. Therefore drug-induced lupus (DIL) due to anti-TNF alpha inhibitors can often be a missed diagnosis. Although exceedingly rare (affecting only 0.3% of patients on these biologics), Anti-TNF DIL presents typically with symmetric small-medium joint polyarthritis, pleuropericarditis, and rash. Renal and neurologic involvement is rare, especially when compared to idiopathic SLE. Unlike traditional DIL, approximately 80% of patients do present with rash which was not present in this case. Autoantibody production with use of TNF-inhibitors is common (ANA 29-77%; dsDNA 10-29%), therefore appropriate clinical symptoms must be present to diagnose drug-induced lupus. In this patient, the presence of a new symmetric polyarthritis and pericarditis in the setting of TNF-inhibitor use with ongoing specific autoantibodies makes drug-induced lupus the most likely diagnosis. Treatment typically only requires removal of the offending agent however our patient did require a steroid taper due to ongoing polyarthritis symptoms.

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VIRGINIA CLINICAL VIGNETTE POSTER FINALIST - John Snellings, MD, FACP

Absence Makes The Colon Grow Fuller

Authors: John Snellings MD

Introduction: While underdiagnosed in the adult population, intestinal hypoganglionosis should be considered as a potential diagnosis for patients with chronic refractive constipation, resistant to measures including aggressive bowel regimens, enemas, and disempaction.

Case Presentation: A 59-year-old Hispanic male was admitted to the hospital with severe, acute-on-chronic refractory constipation, last bowel movement noted eight days ago. Two months earlier, the patient had a thirty-day admission to another hospital with a similar presentation, with no improvement from any attempted treatment modalities, and inability to complete two separate colonoscopy attempts due to poor prep. Past medical history was significant for achalsia, for which the patient reported a corrective surgery in Puerto Rico many years ago.

On physical examination, the patient's abdomen was markedly distended, with multiple palpable sections of bowel filled with stool. The patient was subsequently started on an aggressive bowel regimen with multiple enema attempts; however, after no improvment, the general surgery service was consulted and performed sigmoidoscopy with fecal disempaction, finally yielding significant symptom alleviation. However, when the patient's constipation worsened again immediately after a diet was restarted, computerized tomography of the abdomen showed increasing cecal dilation with leukcytosis. The decision was made to pursue a subtotal colectomy with ileostomy for more definitive symptom control. Concomitantly, concern for colorectal interia secondary to an undiagnosed motility disorder increased, and colorectal biopsies were sent for pathological review. Pathology results revealed an absence of colorectal submucosal and myenteric nerve plexuses, with only rare single ganglion cells seen. No neural hypertrophy or other features of Hirschprung's disease were seen; findings were compatible with a diagnosis of hypoganglionosis.

In outpatient follow-up, the patient's constipation symptoms were improved status-post ileostomy, with only occasional diarrhea now complicating his quality of life; additional rectal biopsy performed six months later showed no ganglion cells on 10 separate samples of varying depths.

Discussion: While congenital causes of chronic refractory constipation, such as Hirschsprung's disease or intestinal neuronal dysplasia, are predominantly diagnosed during early childhood, these conditions should remain on the differentials in constipated adults as well, particularly those revealed to have milder forms of the underlying intestinal pathology. These diseases are frequently overlooked and misdiagnosed in adults, leading to a likely underestimation of their overall incidence in the adult population. Typically, patients seek medical attention with a longstanding history of constipation requiring frequent laxative use. An accurate diagnosis in adults often requires colorectal wall biopsy, with findings of reduced or absent ganglion cells and submucosal/myenteric nerve plexuses.

Patients with intestinal hypoganglionosis are at risk for severe complications including fecaloma, intestinal perforation, and respiratory compromise due to intestinal expansion into the thoracic cavity. Diagnosis of intestinal hypoganglionosis in adults often necessitates surgical intervention as treatment, such as ileostomy, to eliminate the likely return of refractory constipation during attempts of nonsurgical treatments. The surgery is considered curative.

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