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Senior Resident
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Handbook of Abstracts

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Impact of a Sedation Vacation Quality Improvement Project in Intensive Care Units

Jason Ackrivo, MD, Kevin J. Horbowicz, Pharm.D., Jason Mordino, Pharm.D., Maryam El Kherba, MPH, MSHI, Jim Danielson, Charles O'Donnell, MS, RRT, Jaime Murphy, MD.

Objective:

Daily sedation vacations (SV) have been shown to decrease mortality, duration of mechanical ventilation, intensive care unit (ICU) time, hospital length-of-stay, and intensive care associated complications. Until 2013, Boston Medical Center (BMC) had no consistent, sustainable SV protocol. This resulted in only 14% adherence to SV opportunities. In February 2013, a formal, standardized quality improvement (QI) initiative sought to develop a process to conduct consistent daily SVs and to ensure sustainability.

Methods:

We utilized the electronic medical record (EMR) to create a standardized, nurse-driven SV protocol in three medical and two surgical adult ICUs at BMC. An order set for a daily SV task was automatically linked to any standing continuous sedative medication order. As long as the continuous sedative remained active, the SV task would auto-populate on the electronic medication administration record each day to prompt the nurse to assess the patient for eligibility. All patients not meeting exclusion criteria then received a SV. From February 12, 2013 to August 17, 2013, data included number of assessments performed, completion of SV, patient eligibility, and reason for exclusion. Our goal outcomes were SV assessments performed on at least 50% of patient days on continuous sedative, SV conducted on at least 50% of SV assessments, and sustaining this over the study period.

Results:

Of 1,730 patient days of continuously administered sedative during this six-month period, SV assessments were performed 70% (n=1,211) of the time. SVs were conducted on 60.0% (n=726) of days in which an assessment was performed. Common reasons for ineligibility (n=485) included Riker score ≥ 6 or escalating sedative requirements (28.2%, n=137); maximal ventilator or hemodynamic support (27.6%, n=134); and active alcohol withdrawal (13.2%, n=64).

Conclusion:

This QI initiative created a SV protocol that exceeded a goal of 50% SV assessments and 50% SV performance. We were able to attain a 70% adherence rate within the first month, and sustain this over the six-month period, a significant improvement over the previous 14% adherence. Thus, a nurse-driven protocol incorporated into our institution's EMR was able to create a standardized, sustainable SV process.

Unusual Consequences of an Intramuscular NSAID Injection: *Streptococcus pneumoniae* Subdeltoid Bursitis and Endocarditis

Roy Arjoon MD and Ashley Brogan MD

Learning Objectives:

1. Recognize potential infectious complications from commonly administered intramuscular injections
2. Understand the destructive nature, and hence the importance, of rapidly diagnosing less common microbiological causes of endocarditis

Case Presentation

A 30 year old woman with a history of moderate alcohol abuse presented with left shoulder pain, limited range of motion, and fevers. She reported an emergency room visit one week earlier where she was given a ketorolac 60mg injection into the left deltoid muscle for atraumatic back pain. Given leukocytosis, fevers, and an elevated ESR/CRP, she underwent a shoulder ultrasound that showed synovial thickening involving the entire left subdeltoid/subacromial bursa with fluid within the bursa. Aspiration yielded thick yellow fluid. Blood and aspirate cultures grew back penicillin sensitive *S. pneumoniae*. Antibiotics were narrowed from vancomycin and ceftriaxone to only ceftriaxone. The patient subsequently underwent surgical debridement. Once blood cultures cleared, a PICC line was inserted and she was discharged on ceftriaxone. While still on ceftriaxone, she was seen in clinic twelve days later with new onset dyspnea and noted to have bibasilar rales, peripheral edema, and a harsh systolic ejection murmur with a soft diastolic rumble at the apex. The patient was re-admitted for further work up. Transthoracic echocardiogram noted a normal ejection fraction, partly flail and perforated aortic valve, small vegetations prolapsing into the left ventricular outflow tract, and severe aortic regurgitation. She underwent an aortic valve replacement with a St. Jude's valve. Pathology revealed aortic valve tissue with acute inflammation, consistent with valve endocarditis. Blood cultures remained negative on ceftriaxone. The patient denied IV drug use and immunodeficiency work up was unremarkable, including a negative HIV test. The patient was discharged on coumadin and a course of ceftriaxone.

Discussion

This case illustrates the potentially serious infectious complications of intramuscular injections, a common route of medication administration. They can cause severe tissue trauma allowing a portal of entry for infection [1]. Disseminated infectious complications, while rare, can result in significant morbidity and mortality. In this case, hematogenous spread of *S. pneumoniae* resulted in subdeltoid bursitis and endocarditis. Overall, deep bursal infection is quite uncommon, often requiring imaging and aspiration to confirm diagnosis when suspected [2,3]. In approximately 80% of cases, deep bursal infections occur secondary to *S. aureus*; infections due to *S. pneumoniae* remain exceedingly rare [2-4]. Similarly, *S. pneumoniae* causes less than 3% of adult endocarditis cases in the penicillin era [5]. Pneumococcal endocardial infection is often aggressive and associated with high morbidity and mortality given its predilection for the aortic valve and rapid destruction of endothelial tissue [5]. The vast majority of patients with invasive pneumococcal infection have impaired local clearance mechanisms or systemic conditions causing a decreased immune response, such as this patient's history of alcohol abuse [2, 4-5]. Chronic alcohol abuse remains one of the strongest risk factors for invasive pneumococcal disease, including endocarditis. It suppresses structural defense mechanisms and components of the innate and adaptive immune systems. Clinicians must remain vigilant of the rare, but potentially dangerous complications of routine intramuscular injections, especially in immunocompromised patients.

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Category: Senior Talk

Trying Small: Post Conflict Medicine in Liberia

Jessica (Hurst) Bender, MD

“Trying small” was the response I frequently heard on the wards in Liberia when patients wanted to convey that they were slowly improving. The phrase can be applied to the country itself, after years of armed conflict and political instability led to a near complete destruction of Liberia’s infrastructure, particularly its healthcare infrastructure. At the end of the conflict in 2003, there were approximately 50 physicians remaining in Liberia, and the government spent only \$1.60 per person on healthcare that year. Despite the last ten years of peace, I witnessed the continued struggles of Liberia’s healthcare system while doing a six week global health elective at John F Kennedy Hospital (JFK) in Monrovia, Liberia. JFK is Liberia’s tertiary medical center and the primary teaching hospital for the country’s only medical school. The medicine department consists of 3 trained internists and 4 medical officer who have completed a general internship. These physicians run the emergency room, outpatient clinic, HIV clinic, and inpatient ward. The most common disease processes seen on the wards during a six week period included HIV, tuberculosis, malignancy, cirrhosis, and malaria. Noncommunicable diseases were the chief diagnosis in 40% of cases, particularly stroke, heart failure, and complications of diabetes. Despite known prevention strategies such as vaccination or improved sanitation, diseases such as tetanus, meningitis, and typhoid were common. Clinicians at JFK rely on history and physical for diagnosis, as laboratory studies and imaging are frequently unavailable. Lack of resources forces healthcare workers at JFK to use creativity in provision of care. For instance, urine test strips are used to monitor urine ketones in diabetic ketoacidosis (DKA) when glucometer test strips are not available. Although the current state of healthcare in Liberia appears grim, this post-conflict period can be viewed as an opportunity to reprioritize public health and healthcare delivery across the nation. The Liberian Ministry of Health has adopted a Basic Package of Health Services Approach, which has been successful in other post conflict nations in the provision of immunizations, healthcare for children and women, and communicable disease control programs. Nonprofits such as Health Education Relief Through Teaching (HEARTT) and Last Mile Health address the healthcare worker shortage by supplying JFK with rotating visiting physicians and by training frontline healthcare workers in remote villages, respectively. These innovations, along with the creativity and dedication of healthcare workers, are examples of how Liberia is “trying small” in rebuilding its healthcare infrastructure.

Venous Thromboembolism in Patients with AL Amyloidosis

Bever, KM, Sanchorawala V., Seldin DC, Stern, L., Berk, JL., Havasi, A, Sloan, JM. Amyloidosis Center, Boston University School of Medicine and Boston Medical Center, Boston, MA, U.S.A.

Background: The incidence of venous thromboembolism (VTE) among patients with AL amyloidosis (AL) is unknown. Additionally, it is unclear if the nephrotic syndrome associated with AL confers an increased risk of VTE similar to nephrotic syndrome from other causes. We examined the occurrence of VTE among AL patients presenting to a single referral center, identifying clinical and laboratory data predictive of VTE events.

Methods: Selected clinical and laboratory data were collected on patients presenting to the Amyloidosis Center at Boston Medical Center. The electronic medical record was searched for charts containing terms “AL amyloid” and terms related to VTE (including DVT and PE) between January 2003 and September 2013. Cases of VTE were verified by chart review. AL cohorts with and without VTE were analyzed for predictors of thrombotic events.

Results: 929 patients with AL who presented to the Amyloid Clinic since 2003 were identified. Of these, 68 patients (7.3%) were documented as having at least one VTE within 3 years of or following the diagnosis of AL; 77 episodes of VTE total were identified. 13 episodes (17%) of VTE occurred within 100 days of receiving immunomodulatory (IMiD) therapy and 13 episodes (17%) occurred in the 100 days post-stem cell transplant (SCT). 16 (20%) of VTEs were central venous catheter-associated. 28 out of 281 AL patients (9.9%) with nephrotic-range proteinuria (urine protein of >3.5gm/24 hours) had VTE.

Discussion: Analysis of a single referral center experience reveals high rates of VTE among AL patients, particularly among those with nephrotic-range proteinuria. Treatment with SCT and IMiD therapy and the use of indwelling central venous catheters are risk factors for VTE among AL patients. Additional analyses correlating clinical, treatment and laboratory characteristics with risk of VTE will be presented.

Senior Talk Abstract:

Advanced Directives: It's Not Just a Checklist

Author: Sanjeeb Bhattacharya

Throughout training as physicians, we learn disease processes and specific therapies. However, we gloss over the approach in discussing end of life care and advanced directives; physicians tend to treat advanced directives as a checklist that needs to be completed as a patient is admitted, disregarding the powerful implications this choice has on a patient's life. It was not until the death of my grandmother that I really took an in depth look on how physicians are in discussing advanced directives. The objective of this senior talk was to examine how physicians discuss advanced directives, identifying the deficiencies, and finally propose solutions to improve completion of advanced directives.

The cases of Karen Ann Quinlan in 1975 and Nancy Cruzan in 1983 are important milestones in the history of advanced directives. These landmark cases gave rise to the Natural Death Act and the Patient Self Determination Act, which empowered patients with living wills and advanced directives. This had great implications on patient autonomy, which is paramount in western bioethics. Despite the importance, studies showed that only 18-30% of Americans have completed an advanced directive. Consequences include potentially acting against patient's wishes and the rise of health care cost (health care costs rise toward end of life).

Barriers to completing advanced directives come from both patients and physicians. Patients have inadequate education on advanced directives, difficulty in execution, perception that advanced directives will not be followed, reluctance to broach end of life discussions, and the thought family and friends will know what to do. Barriers for physicians were time, lack of familiarity, and lack of awareness of palliative therapies. Underlying these issues were a mix of disparities in education, religion, cultures, and mistrust.

Interestingly, a multisystem approach yielded better results than merely educating patients and physicians. The most compelling study was called Respecting Choices from Wisconsin where a multifaceted approach was undertaken; Specially trained health care workers provided thorough education to patients. As a result, completion of advanced directives increased from 15 to 85%. This shows that as with many things in medicine, a system based solution may be the best to educate and empower patients about advanced directives.

Assessment of Reproducibility – Automated and Digital Caliper ECG Measurement in the Framingham Heart Study

Gordon M. Burke, MD^a, Na Wang, MA^b, Sue Blease, MPH^c, Daniel Levy, MD^{c,d}, Jared W. Magnani, MD, MSc^{c,e}

^a Department of Medicine, Boston University Medical Center, Boston, MA

^b Data Coordinating Center, Boston University School of Public Health, Boston, MA

^c National Heart, Lung, and Blood Institute's and Boston University's Framingham Heart Study, Framingham, MA

^d Center for Population Studies and the Division of Intramural Research, National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, MD

^e Department of Medicine, Section of Cardiovascular Medicine, Boston University, Boston, MA

Background. Digitized electrocardiography permits the rapid, automated quantification of electrocardiograms (ECGs) for analysis. Community- and population-based studies have increasingly integrated such data. Assessing the reproducibility of automated ECG measures with manual measures is a critical step in preparation for using automated measures for research purposes. We recently established an ECG repository of digitally recorded ECGs for the Framingham Heart Study and we sought to assess the reproducibility of automated and manual measures.

Methods. We selected 185 digitally recorded ECGs from routine visits of Framingham Heart Study participants spanning from 1986 to 2012. We selected the following ECG measures for their relevance to clinical and epidemiologic research: P wave duration, P wave amplitude, and PR interval in lead II; QRS duration and R wave amplitude in lead V6; and QT interval in lead V5. We obtained automated values for each waveform, and used a digital caliper for manual measurements. Digital caliper measurements were repeated in a subset (n=81) of the samples for intrarater assessment.

Results. We calculated the intraclass correlation coefficient (ICC) values for the interrater and intrarater assessments. P wave duration had the lowest interrater ICC (r=0.46) and lowest intrarater ICC (r=0.57). R wave amplitude had the highest interrater and intrarater ICC (r=0.98) indicating excellent reproducibility. The remaining measures had interrater and intrarater ICCs of $r \geq 0.81$.

Conclusions. The interrater reproducibility findings for P wave amplitude, PR interval, QT interval, QRS duration, and R wave amplitude were excellent. In contrast, the reproducibility of P wave duration was more modest. These findings indicate high reproducibility of most automated and manual ECG measurements.

Impact of Objective Guidance on Anesthesiology Resident Resuscitation Skills

Matthew Chakan, MD^a & Ruben Azocar, MD^b

^aDepartment of Medicine, Boston Medical Center; ^bDepartment of Anesthesiology, Boston Medical Center

INTRODUCTION: Patients who require cardiopulmonary resuscitation (CPR) have dismal rates of survival to hospital discharge. There are few interventions that can improve survival other than providing quality CPR. Few studies have attempted to provide guidance across all ventilation variables, so this study was performed to determine if increased levels of guidance will increase the proportion of resuscitations compliant with guideline targets.

METHODS: An electronic device, the Exact Instrument of Resuscitation (EIR; Figure 1), was built to couple with a bag-valve-mask (Figure 2) and provide real-time guidance for: tidal volume by displaying the actual volume during administration, ventilation frequency by alighting an LED at the recommended frequency (5 seconds for rescue breathing), and inspiratory duration by keeping the ventilation LED lit for 1 second.

Random Anesthesiology residents (n=15) performed one minute of bag-valve-mask rescue breathing followed by two cycles of one-rescuer CPR at baseline, after review of guideline targets, and with direct EIR guidance. A manikin airway sensor array identical to the EIR was used to calculate the tidal volumes, ventilation frequencies, inspiratory durations, and maximum ventilation pressures. The proportion at target were compared with chi-square analyses in Microsoft Excel, utilizing alpha of 0.05.

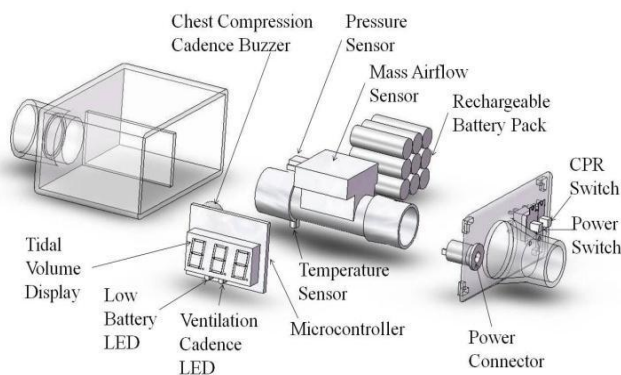


Figure 1. An exploded view of the Exact Instrument of Resuscitation.

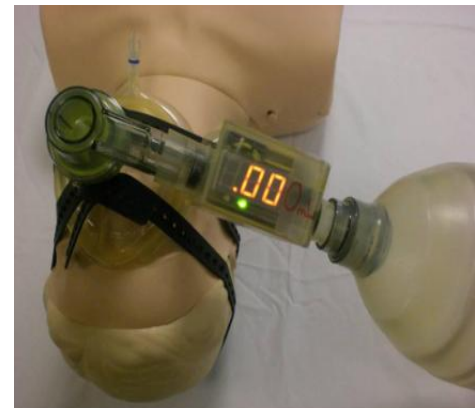


Figure 2. The EIR connected to a bag-valve-mask.

RESULTS: Rescue breathing tidal volumes tended to run low (Table 1), with little effect from guidance, while ventilation frequency and minute ventilation were substantially improved by EIR guidance. Inspiratory duration tended to be appropriately long, with little effect from guidance. The maximum ventilation pressure tended to be modestly lower with EIR guidance.

CPR tidal volumes tended to run low (Table 1), with modest improvement using EIR guidance, although generally with more inappropriately large volumes compared to rescue breathing. Inspiratory duration tended to be appropriately long, with moderate improvement from EIR guidance. The maximum ventilation pressure tended to be much lower with EIR guidance, although generally with higher pressures compared to rescue breathing.

Table 1. Proportion of rescue breathing and CPR ventilations at target

	Rescue Breathing						CPR			
	Tidal Volume 420-490 mL (%)	Tidal Volume <490 mL (%)	Vent. Freq. 10-12/min (%)	Min. Vent. 4-6 L/min (%)	Insp. Dur. ≥ 1.0 sec (%)	Max. Press. <30 cmH ₂ O (%)	Tidal Volume 420-490 mL (%)	Tidal Volume <490 mL (%)	Insp. Dur. ≥ 1.0 sec (%)	Max. Press. <30 cmH ₂ O (%)
Baseline	41 a	89 b #	8 d f	33 h	85 k &	77 n ~	35 q	53 r #	62 t &	33 v ~
Instruction	56 a @	89 c \$	35 d g	47 j	91 k m *	71 p "	40 @	65 s \$	65 u *	40 x "
EIR	48	99 b c ^	76 f g	87 h j	84 m	91 n p ?	57 q	92 r s ^	82 t u	75 v x ?

p<0.05 for: a b c d f g h j k m n p q r s t u v x @ # \$ % ^ * ~ " ?

DISCUSSION: In general, ventilation quality is poorer during CPR than during rescue breathing. Utilization of direct guidance improves the quality of rescue breathing and CPR ventilation quality, while review of guideline targets alone offers little improvement. Given the tendency for suboptimal ventilation during CPR, direct guidance is likely needed for optimization of CPR quality. Further research is needed to determine if this can lead to decreased mortality.

A Curious Case of *Lactobacillus Casei* in a Prosthetic Joint: Was it the Yogurt?

Authors: Chen, Billy; Ariela Orkaby; Iliaki, Eirini; Sulis, Carol; Oates, Daniel

Mentor: Daniel Oates

Abstract: Case: 95-year-old white woman with a history of hypertension, insulin-dependent diabetes, coronary artery disease, chronic systolic heart failure, and dementia who underwent left total hip replacement 1.5 years ago after a fall resulting in a displaced intertrochanteric fracture of the left proximal femur, presented with a draining ulcer on her lateral left thigh. Three months prior, she began experiencing left hip discomfort. Plain films obtained revealed no evidence of a fracture or change in the position of her prosthetic hardware. Three days before admission, she was noted to have a stage III ulcer along the lateral aspect of her left thigh with a moderate amount of serosanguinous drainage.

Workup: Laboratory tests were notable for leukocytosis (WBC 11,500/IL) with a differential of 76% polymorphonuclear cells, a mildly high erythrocyte sedimentation rate (46 mm/h; normal 0–30mm/h), and a high C-reactive protein (66.9 mg/L; normal 0–5 mg/L). CT images of her left lower extremity showed an elongated, heterogeneous, complex collection in the left thigh; ultrasound-guided aspiration of the collection produced hemorrhagic material that was sent for microbiology. She underwent debridement of the left hip, excision of a sinus tract, and modular exchange of the hemiarthroplasty components. Cultures were obtained from the intracapsular synovium, extracapsular tissue, and superficial sinus tract.

Discussion: Superficial wound cultures grew methicillin-sensitive *Staphylococcus aureus* (MSSA). Deep cultures from the initial ultrasound-guided aspiration fluid and the intracapsular synovium grew lactobacillus species, eventually identified as *Lactobacillus casei* and *L. paracasei*. Lactobacilli are gram-positive, nonmotile, nonspore-forming anaerobes or facultative anaerobes, generally found as commensals in the gastrointestinal tract and vagina. Infection with *L. casei* and *L. paracasei* is incredibly uncommon. Review of her supplements, the yogurt she ate at the rehabilitation facility and at home contained *L. casei*. Whether her wound was inoculated with *L. casei* and *L. paracasei* from her food or from local spread from gut or vaginal flora is unknown. The isolate was sensitive to penicillin, gentamicin, erythromycin, clindamycin, and linezolid but resistant to vancomycin. The antibiotic regimen was changed, and she completed 4 weeks of intravenous penicillin G followed by a prolonged course of suppressive therapy with oral dicloxacillin. This extended antibiotic course was chosen because her femoral hardware remained in place and could not safely be exchanged without risk of serious complications. She improved on this regimen and at her last clinic visit was ambulating with a walker, which was her premorbid functional baseline.

Category: Senior Talk Abstract

"I can't remember to forget you" and other love songs about HIV

(The dysfunctional relationship between HIV and adaptive immunity)

Matthew Collins, MD

Mentors: Rachel Simmons, Manish Sagar, Andrew Henderson

The discovery of highly active antiretroviral therapy (HAART) was a major landmark in combating the HIV epidemic that has been responsible for 3 million life years saved in the US alone. However, only 1 in 5 HIV+ individuals in the US is on HAART. Internationally, approximately one-third of those meeting WHO guidelines for HIV treatment are receiving it. Moreover, there is increased mortality and morbidity in patients successfully treated with HAART compared to controls. Clearly, HAART in its current state is not the answer to the HIV epidemic. Curing HIV infection is an attractive alternative to life-long HAART that could restore health, longevity, and avoid medication toxicity. The major barriers to curing HIV can be classified in two domains: host immune response and HIV virology. During chronic viral infections, T cells exhibit diminished effector function over time in a characteristic pattern termed exhaustion. This process is associated with expression of inhibitory surface receptors such as programmed death 1 (PD-1). Blocking inhibitory receptors in vitro and in vivo has been shown to restore effector functions of T cells and reduce viral load in animal models, raising the hope that the host immune response can be "reinvigorated" and contribute to HIV cure. At the DNA level, latent HIV infection is a reversibly nonproductive state of replication-competent, integrated proviral DNA. HAART is ineffective against latent HIV, but is required indefinitely to prevent new transmission when latent HIV is reactivated. Factors that regulate latency include cellular activation state, transcriptional interference, availability of crucial host transcription factors, tat function, chromosomal organization, and epigenetic modifications. A popular idea among some experts is that cellular reservoirs of HIV could be targeted by therapeutic interventions to "wake up" latent virus. Further propagation of infection would be prevented by HAART and the residual infected cells could be eradicated by the immune system, resulting in cure of HIV infection. For example, one group has discovered a candidate drug (5HN) through large-scale screening of small molecule libraries. 5HN markedly increases HIV production in in vitro models of latency, but does so without inducing global cellular activation, representing the potential for efficacy without toxicity. In addition to considerable work in a variety of experimental models, a few clinical trials are exploring immune exhaustion and molecular regulation of HIV latency. Yet, no available interventions can surmount the paradox of HIV preferentially persisting in the genome of the cells of the progressively failing adaptive immune system. Thus, humans "can't remember to forget" HIV infection. Further understanding of both memory T cell responses to chronic infection along with the molecular processes that mediate HIV latency may yield therapeutic strategies that enable cure of HIV infection in humans.

Category: Senior Talk

The Cuban Healthcare System: Complexities in Public Health and Human Rights

Matthew T. Corey, MD, MA Latin American Studies

Mentor: Julio C. Pita, MD

A unique confluence of factors have shaped the Cuban healthcare system: the socialist revolution against a US-dominated government in 1959, a family doctor-centered health delivery system, an internationalist model of physician training, and a controversial policy of exporting doctors to Venezuela and beyond. Under Castro, Cuba can mark a series of achievements in community medicine. These strides stand in contrast, however, to a human rights record that is marked with violations of international norms in civil liberties.

Cuba is a single-party Communist state whose healthcare system is organized along principles of social medicine: universal coverage, which is free of charge, under central state control. Public health efforts have historically focused on prevention, especially immunization, sanitation and the eradication of infectious diseases, including poliomyelitis, measles, pertussis, *H. influenzae* B, and now pediatric hepatitis B. With low-tech, community-oriented interventions into prenatal care, incidences of low birth weight and infant mortality have decreased to levels comparable with Canada's.

Among the innovations instituted in Cuba is a health delivery system with a family doctor resident in each community. This model is being disseminated abroad through the Latin American School for Medical Sciences, which educates non-Cuban students from disadvantaged backgrounds to become community physicians in their home countries. The Cuban model is also exported through the direct exportation of healthcare workers, especially to Venezuela, where 20,000 Cuban doctors are serving needy areas in return for shipments of subsidized oil to Cuba.

However, despite all the strides that the Cuban system has made in social medicine, both at home and abroad, impartial organizations have indicated Cuba's record on human rights as being poor. Dissenters face a range of threats: arbitrary detention, beatings, public acts of shaming, termination of employment, and long-term imprisonment. All means of communication are controlled by the state, and public criticism of the state is largely forbidden. Ironically, doctors themselves have been oppressed for speaking out against the government's record in fighting diseases.

Category: Clinical Case Vignette

An Unsolved Mystery Case of Central Diabetes Insipidus

Ricardo Cruz, MD

Mentor: Ryan Chippendale, MD

Case: A 26 year old male presented with complaints of dry mouth, polyuria, polydipsia, polyphagia, and a burning sensation in his lower extremities for one month. His physical exam was notable for a morbidly obese gentleman with decreased sensation of his lower extremities bilaterally. Labs demonstrated a markedly elevated serum sodium level (168), a low Antidiuretic Hormone (ADH) level (less than 0.1), and a serum and urine osmolality of 345 and 185 respectively, consistent with central Diabetes Insipidus (DI). Pituitary function testing was notable for low total testosterone and leutinizing hormone consistent with hypogonadotrophic hypogonadism. A brain MRI revealed a normal pituitary gland, hyperintensities within the cerebellum and corpus callosum, enlargement of the adenoids, and lymphadenopathy within the retropharyngeal and parotid nodes. Due to this an infiltrative cause of DI was suspected. Later that year, he developed acute respiratory failure secondary to diastolic heart failure, requiring placement of a tracheostomy and gastrostomy tube. At this time he was found to be anemic and to have significant splenomegaly of 18cm. Given the constellation of laboratory and physical findings, a unifying diagnosis of POEMS syndrome was considered. Further work-up resulted in T cell predominance on flow cytometry, a normal lactate dehydrogenase and haptoglobin level, and a monoclonal lambda gammopathy on serum and urine immunofixation. The vascular endothelial growth factor (VEGF) level was normal, and bone marrow was without evidence of plasma cell neoplasm, nonhodgkin lymphoma, or acute leukemia.

Discussion: Central DI is a condition, which there is lack of production of vasopressin by the pituitary. It is characterized by excessive urination and volume depletion leading to hypernatremia. Causes of acquired central DI include intracranial mass lesions, brain trauma, and infiltrative disorders including sarcoid or Langerhans Cell histiocytosis.

POEMS syndrome is a rare paraneoplastic syndrome arising from an underlying plasma cell disorder. The acronym POEMS refers to some of the distinguishing features of the disorder including polyradiculneuropathy, organomegaly, endocrinopathy, monoclonal plasma cell disorder, and skin changes (hyperpigmentation, hypertrichosis, flushing). Other potential features include sclerotic bone lesions, Castleman's disease (lymph node hyperplasia), pleural effusion, edema, ascites, and thrombocytosis. The pathogenesis of this syndrome is not well understood but thought to be due to elevated VEGF production that enables angiogenesis. Diagnosing POEMS is based on a composite of clinical and laboratory features. The diagnosis is made when both mandatory major criteria (polyneuroradiculopathy and monoclonal plasma disorder) are met, along with 1 out of 3 other major criteria (Castleman's disease, sclerotic bone lesions, and VEGF elevation), and 1 out of 6 other minor criteria are present (organomegaly, extravascular volume overload, endocrinopathy, skin changes, papilledema, thrombocytosis/polycythemia).

Conclusion: Although suspicious for POEMS syndrome, after extensive work-up, this patient did not meet the major and minor criteria to solidify the diagnosis. Therefore, the primary etiology of this patient's central DI remains an unsolved mystery.

Category: Clinical Research

Does Functional Mitral Regurgitation Alter Prognosis in Patients with Severe Left Ventricular Systolic Dysfunction?

Samer Mowakeaa, MD; Aeshita Dwivedi, MD; Jason R Grossman, MD; Gaurav Parikh, MD; Jill Grounds, MD; Scott Kinlay, MBBS, PhD; Zelmira Curillova, MD; Deepak L Bhatt, MD, MPH; Jayashri Aragam, *Contributed equally to this study

Introduction: Patients with advanced cardiomyopathy (CMP) often develop significant mitral regurgitation despite structurally normal mitral leaflets, known as functional mitral regurgitation (FMR). Clinical and echocardiographic correlates of FMR are not well defined and the prognostic impact of FMR in patients with advanced CMP is controversial.

Methods: The medical records of 487 consecutive patients (age 69 ± 11 yr, 98% men) with left ventricular ejection fraction (LVEF) $\leq 35\%$ who underwent a transthoracic echocardiogram at a single Veterans Affairs medical center in 2009 and 2010 were reviewed. Patients with mitral leaflet pathology or significant aortic valve disease were excluded. The remaining 370 patients were categorized into three groups based on the American Society of Echocardiography guidelines for quantification of mitral regurgitation: 1) No FMR, 2) Mild FMR, 3) More than mild FMR. The following information was collected: patient demographics and co-morbidities, echocardiographic findings and outcomes data including all-cause mortality and hospitalizations for heart failure (HF), myocardial infarction or stroke.

Results: When compared to patients in group 1, those in groups 2 and 3 were more likely to be older ($p=0.0001$), have a greater body surface area ($p=0.0003$), atrial fibrillation ($p=0.018$), a higher New York Heart Association Class ($p=0.001$) and higher creatinine levels ($p=0.001$). Echocardiographically, these patients were more likely to have greater left ventricular end-diastolic and end-systolic dimensions ($p=0.04$ and $p=0.005$, respectively), greater left atrial size ($p=0.003$), and a lower LVEF ($p=0.0001$). They also had higher pulmonary arterial systolic pressure ($p=0.0001$), and more severe tricuspid regurgitation ($p=0.001$). Unadjusted univariate Cox Model analysis showed that presence of either mild or more than mild FMR was associated with a higher risk of death from any cause [Hazards ratio (HR): 1.8, $p=0.02$ for Group 2 vs. Group 1; HR: 2.6, $p=0.001$ for Group 3 vs. Group 1] and hospitalization for HF (HR: 2.5, $p=0.002$ for Group 2 vs. Group 1; HR: 3.9, $p=0.001$ for Group 3 vs. Group 1). There was no increase in the risk of myocardial infarction or stroke in patients with FMR. After adjustment in a multivariable Cox Model, the significantly increased risk of hospitalization for HF and death from any cause persisted for group 3 (HR: 1.8, $p=0.02$).

Conclusion: In patients with advanced CMP, presence of more than mild FMR is associated with an increased risk of death from any cause and hospitalization for HF.

Category: Clinical Research

A Study of Lebanese Sexual Minority Women's Health

Jessica Gereige, MD, Ulrike Boehmer, PhD

Extensive research on the health of sexual minority women (SMW) (defined as lesbian, bisexual identified women, and women who partner with women) in Western countries has suggested that their health differs in key ways from that of heterosexual women. For example, SMW are at higher risk of breast cancer, ovarian cancer, and cardiovascular disease. They are also more likely to smoke tobacco and abuse alcohol and other recreational drugs. However, there are limitations to this body of knowledge, in that to date most research has been conducted in developed Western countries and most research is focused on white SMW, leaving it unclear whether the documented health disparities apply to SMW of non-white race or ethnicity and SMW in other regions of the world. On the one hand, because gender inequity is significantly more prominent in developing nations compared to industrialized Western countries, it is possible that the gap between heterosexual and SMW narrows in the face of gender-based inequities. On the other hand, based on the theory of intersectionality, a Middle Eastern sexual minority woman's experience would be more powerful than the sum of her sexuality and her sex taken independently, therefore resulting in greater disparities between SMW and heterosexual women in the Middle East.

Our study goal was to look at these novel questions in a matched cohort of Lebanese SWM and heterosexual women. Collecting data from self-administered surveys completed by SMW, and age and religion-matched heterosexual women, we sought to assess health disparities that may exist between these two groups. Our specific aims were: 1. To compare the physical and mental health of women in Lebanon based on sexual orientation. 2. To compare the health care access and health behaviors of women in Lebanon based on sexual orientation 3. To examine the relationship between sexual orientation and discrimination. Using standardized measures, we have conducted a one-time anonymous survey of both groups.

For the pilot study, we have recruited a convenience sample of 46 SMW and 50 heterosexual women. Preliminary results are consistent with the hypotheses listed above. For example, based on our results, we found no difference in cervical cancer screening between SMW and heterosexual women in Lebanon. This is in contrast to Western studies that show that SMW are less likely to have PAP smears than their heterosexual counterparts. On the other hand, we found higher rates of substance abuse as well as higher rates of attempted suicide in the SMW cohort than in the heterosexual one, consistent with studies in the West. Further analysis is yet to be done, but we hope that in defining the specific health care needs of SMW in Lebanon, health care providers will be made aware of the disparities and the specific needs of this population, placing them in a better position to improve Lebanese sexual minority women's health.

Category: QI Research

Morning Report, Patient Flow and Resident Satisfaction

Rajat Goyal, MD

Jason Ackrivo*, Rajat Goyal*, Hong Yun, Ashish Upadhyay
Boston University's Internal Medicine Residency Program

*Contributed equally

Objective: The purpose of this study was to evaluate the impact of changing internal medicine residency program's morning report (MR) time from 10-11am to 7:30-8:30am on patient flow, and to assess residents' preference between the two MR times.

Methods: We compared discharge data from four medicine ward teams for two weeks before and two weeks after the MR time change in February 2013. Outcomes examined were the percentage of discharges before 2 pm, average hospital length of stay (LOS), and percentage of discharges with LOS of <3 days. In addition, an online survey was conducted to assess residents' preference between the two MR times.

Results: There were 120 and 112 discharges in the two-week period before and after the MR time change respectively. The percentage of discharges prior to 2 pm was not significantly different before and after the intervention (22% versus 27%, $p=0.36$). The average LOS was 0.9 days shorter in the post-intervention period but the difference was not statistically significant (4.37 versus 3.47 days, $p=0.08$). Similarly, the percentage of discharges with LOS of <3 days was also not significantly different before and after the intervention (43% versus 48%, $p=0.38$). Despite neutral findings on patient flow, 34 of 39 residents who were exposed to both MR times and responded to our survey preferred 7:30-8:30am MR time.

Conclusions: The timing of MR had little impact on patient flow. Internal medicine residents, however, overwhelmingly prefer the earlier MR time.

Title: Squeaking By: A Case of Lymphocytic Choriomeningitis

Authors: Christina Harding MD, Manish Sagar MD

Department of Medicine, Boston University School of Medicine, Boston, MA

Introduction: Lymphocytic choriomeningitis virus (LCMV) is a rodent-borne virus associated with mice and pet hamsters. It is often an unrecognized self-limiting, febrile illness or manifests as a CNS disease, predominantly aseptic meningitis or meningoencephalitis. During pregnancy, infection can lead to miscarriage and congenital malformations, and in organ transplantation, it can cause severe, disseminated, and often fatal disease. Increasing physician awareness of LCMV as a cause of meningitis could lead to improved recognition, diagnosis, and case reporting and improve prevention and control efforts, decreasing disease spread among vulnerable populations.

Case: A 41 year old Hispanic female with past medical history of a Gastrointestinal Stromal Tumor s/p induction gleevec and resection presented to the emergency room with headache, photophobia, and subjective fevers for approximately ten days. She had presented four days prior to this presentation also complaining of headache and was discharged home. She returned to the emergency room because of progressively worsening headache that was constant in nature and unresponsive to ibuprofen and was associated with nausea and vomiting. She appeared uncomfortable but her vitals were stable, and she had no focal neurological deficits. A head CT was negative. An LP showed clear CSF fluid with an unusually elevated WBC of 2075 with 85% lymphocytes, an elevated protein level of 147, and a normal glucose level of 42. Gram stain was negative. HSV and Enterovirus CSF PCR were negative. During admission posterior cervical and axillary lymphadenopathy was noted. Given suspicion for LCMV, serology was sent and returned with high titers of both IgG and IgM. She was treated supportively for her symptoms without any empiric antibiotics, and she subsequently improved and was discharged with outpatient ID follow up. Infection was reported to DPH.

Discussion: LCMV is an under-diagnosed cause of aseptic meningitis. Although often unrecognized, data suggest that 10-15% of aseptic meningitis cases are due to LCMV infection and that approximately 5% of adults have antibodies indicating prior infection. The differential is broad but includes Enterovirus, HSV1&2, HIV, EBV, Arboviruses, TB, Syphilis, Lyme, drug reactions, and malignancy. It classically presents in late Autumn and early Winter when mice migrate inside homes to escape the cold. Transmission occurs through direct or aerosol contact with mice excreta, through transplantation of infected organs, or by vertical transmission from mother to fetus. Laboratory workers or rodent breeders who have direct contact with the animals or individuals exposed to large mouse populations or infestations are at risk for infection. Clinical presentation can manifest as a biphasic illness with phase 1 involving fever, headache, and sometimes LAD and a maculopapular rash with resolution of symptoms and phase 2 includes a return of worsening symptoms with a more severe headache, stiff neck, and fatigue. Very high CSF leukocytes are typical for infection. Mortality is less than 1 percent for healthy hosts and complete recovery is expected, but infection is often fatal in organ transplantation. Treatment is supportive for healthy individuals but for organ recipients, who develop febrile illness in the early post-transplant period, prompt testing for LCMV is advised and early initiation of Ribivarin is recommended. Prevention strategies include wearing protective gear when directly handling rodents, preventing physical interactions between wild and captive rodents, and avoiding exposure when immunosuppressed or pregnant. Vaccine development against arenaviruses using recombinant technology is underway and shows promise. The recognition of LCMV as a probable pathogen allows for essential diagnostic testing, prompt reporting to DPH, appropriate risk reduction discussions, and withholding of unnecessary antibiotics.

Category: Clinical Case Vignette

Colchicine in the Management of Subacute Pericarditis Associated with Large Pericardial Effusion

Huang, Gary; DiPetrillo, Melissa

Mentor: Melissa DiPetrillo

Introduction: 47 year old female with a history of asthma presented to the hospital with progressive pleuritic chest pain and shortness of breath over a period of 4 months. She was hospitalized 4 months prior with similar complaints and was treated with levofloxacin for pneumonia. Her chest pain at that time was attributed to costochondritis. The patient underwent an echocardiogram shortly after this admission that showed a large pericardial effusion measuring 4cm posterolaterally and apically, while measuring 1cm anteriorly with fibrinous debris throughout the pericardial fluid. There were no frank signs of tamponade.

Case Description: This patient had a symptomatic, large pericardial effusion without tamponade physiology. Vital signs were significant for an elevated heart rate of 100 BPM. Physical exam showed signs of volume overload, with trace pitting edema in her lower extremities bilaterally, faint bibasilar crackles, and an elevated JVP of 10cm. ECG was normal, and labs were only significant for a mildly elevated BNP of 148. She underwent a diagnostic and therapeutic pericardiocentesis, producing 1.5 liters of bloody fluid. Subsequent fluid analysis ruled out malignant, tuberculous, bacterial, or rheumatologic etiologies. Viral pericarditis was assumed, and she began treatment with colchicine monotherapy; NSAIDs were held in the setting of bloody pericardial effusion. Follow-up TTE performed two days later showed persistent pericardial effusion, unchanged in size. The patient also continued to complain of pleuritic chest pain and dyspnea on exertion. Given the persistence in her symptoms and pericardial effusion, as well as the possibility of the effusion being loculated, CT surgery was consulted for placement of a pericardial window. However, a repeat TTE four days later for re-evaluation of effusion size showed near-resolution of the effusion. She was subsequently discharged on colchicine to complete at least one month of therapy. On her follow-up cardiology clinic visit, she reported resolution of her chest pain and shortness of breath.

Discussion: This patient with a symptomatic, large pericardial effusion improved after therapeutic pericardiocentesis and treatment with colchicine monotherapy. She was continued on colchicine for a total of 3 months. Prompt treatment with colchicine in this patient with presumed viral pericarditis resulted in resolution of her large pericardial effusion and prevented unnecessary procedures.

Category: Clinical Case Vignette

Hidden Beneath the Surface: a case of Visceral Kaposi's Sarcoma

Emily Hughes MD, Sabrina Assoumou MD MPH

Introduction:

Kaposi's sarcoma (KS) is the most common Human Immunodeficiency Virus (HIV)-related malignancy and it occurs primarily in men who have sex with men (MSM) with human herpes virus-8 (HHV-8). Visceral involvement as the initial manifestation of KS is relatively uncommon.

Case Presentation:

A 50-year-old MSM with HIV who had been lost to care was admitted with complaints of 1-2 months of progressive dyspnea on exertion, dry cough, occasional subjective fevers, night sweats and approximately 15 pounds of weight loss. 6 months prior he had been running 12 miles daily but more recently became dyspneic with simple household activities. He had previously been on antiretrovirals (ARVs) for 3 years but discontinued therapy 1 year prior due to social issues. There were no recent exposures to tuberculosis (TB); and tuberculin skin testing was negative in 2009. There was no history of incarceration, homelessness, substance use, recent travel, or sick contacts. Past medical history was notable for *Pneumocystis jiroveci* pneumonia (PCP), syphilis, herpes zoster, oral candidiasis, ?genital HSV and depression. Initial vital signs with heart rate 106, respirations 22 and O₂ saturation 96% on room air. Physical exam was notable for cachexia, evidence of oral thrush, no aphthous ulcers, no lymphadenopathy, diminished breath sounds at the left base and no skin lesions noted. Chem 7 was unremarkable. Chest x-ray showed an ill-defined opacity in the posterior left lower lobe. Empiric treatment for community-acquired pneumonia and PCP were initiated. Further labs showed CD4 190 cells/mm³ and viral load 119,022 copies/mL. CT of the chest revealed diffuse subpleural ground glass opacities. Further work-up included negative induced sputum for DFA and AFB, bronchoscopy with multiple areas of flat black/dark purple discoloration throughout the airways, positive beta-D-glucan and positive quantiferon test. A more thorough mucosal exam revealed a subtle 3x3mm bluish-violet patch on the left hard palate, but still no cutaneous lesions. He was discharged with diagnoses of PCP, possible pulmonary KS, oral candidiasis and latent TB infection (LTBI). Following discharge, biopsy of the hard palate lesion was consistent with KS. PET/CT showed hypermetabolic pelvic lymph nodes and increased activity in the lower esophagus, stomach and rectum/anus, but no uptake in the lungs or hard palate. EGD/colonoscopy were negative. He has been managed with ARVs as well as Doxil for visceral KS. Treatment for LTBI is planned after chemotherapy.

Discussion:

Pulmonary KS should be included in the differential of severely immunosuppressed HIV-infected patients with respiratory symptoms, even in the absence of cutaneous lesions. It can be an elusive clinical diagnosis because the accompanying respiratory symptoms and radiographic findings can mimic a variety of other infectious and neoplastic processes seen in HIV-infected patients. The presumptive diagnosis of pulmonary KS is often clinical based on epidemiologic features, the presence of mucocutaneous lesions, the patients' degree of immunodeficiency, radiographic features, the appearance of endobronchial lesions and the exclusion of other processes. The mainstay of treatment is ARVs; however, systemic chemotherapy is often added for symptomatic visceral involvement given poor prognosis without it.

Category: Clinical research

Is the level of Medicare support associated with the quality of Internal Medicine residency training?

Manas Kaushik MD ScD, Ananya Roy ScD

Introduction: Medicare is the largest supporter of graduate medical education (GME) in United states, paying approximately \$3 billion to training sites towards the direct costs of running residency programs. However, these payments are based on hospital self reports of training costs and not linked to any measures of accountability from its recipients We assessed state wise and regional variation in program pass rates on a standardized exam – a measure of academic accountability and evaluate the relationship of the level of funding support to Internal Medicine programs with program pass rates – a standardized measure of the quality of GME training.

Methods: Study sample: All Internal Medicine programs listed with ACGME were eligible (n=419). 17 military programs, 46 programs with lapsed accreditation, 15 programs accredited in the study period (2009-2011) were excluded (n=358). 341 programs who were current accredited, which had at least ten (10) residents appearing for the American Board of Internal Medicine(ABIM) examination in 2009-2011 and on whom Medicare cost reports were available were included in this study.

Exposure: We utilized cost reports submitted to the Centers for Medicare and Medicaid Services to calculate per resident amount paid by Medicare for resident support, benefits for faculty who supervise residents, institutional overhead costs and other exclusively GME-related administrative costs.

Outcomes: We used publicly available program level board pass rates of the first time test takers from 2009-2011.

Statistical analysis: Internal Medicine programs were the unit of analysis. We used generalized estimating equations (GEE) to assess the marginal effects of factors associated with program characteristics on board scores.

Results: State-wise pass rates showed variation that did not reach significance. 47% of northeast programs were in the 3rd tertile of cost of training (\$110,790-\$234,553) vs 20% of programs in South. Unadjusted Pass rates declined 1.2% (SE: 1.9, P value 0.53) for each additional \$10,000 in Medicare support. Adjusted pass rates were declined 0.2% (95%CI -0.69, 0.12 P Value: 0.16).

Conclusions: This is the first study to investigate the relationship between the level of Medicare funding and the academic outcomes of Internal Medicine programs. We found a wide variation in the cost of graduate training but no association between the level of funding and quality of residency training. These results suggest an opportunity to improve cost effectiveness of GME and strengthening linkage between payment and quality of training to improve taxpayer return.

Category: Senior Talk

Title: The EHR - A Rocky Road to the Digital Future

Author: Kirshenbaum, Daniel

Abstract: A large portion of every day as a physician is spent interacting with an electronic health record (EHR). Understanding how to use an EHR effectively and efficiently is quickly becoming required knowledge for the modern physician. Studies show that most physicians now spend a higher percentage of their time entering and reviewing data in the EHR than any other activity, with estimates as high as 57%, more than double the time actually spent with patients. The US federal government has determined that the widespread use of EHRs is so important that it created large financial incentives for hospitals and individual physician practices that implement EHRs that meet certain meaningful use criteria under the HITECH Act, spending nearly \$20 billion already by the end of 2013. Hospital systems and individual physicians are investing heavily in EHR systems, with some institutions investing upwards of \$700 million to implement them. Given the massive investment that the government and healthcare institutions are making into EHRs, as well as the fact that physicians are spending around half their time using the EHR, physicians should have a better understanding of how the EHR will affect patient care. This talk begins with a review of the history of the EHR, dating back to the 1960s, when the first EHR systems, known then as clinical information systems, were developed. I discuss the development of the first EHRs, including the well-known EHR of the Department of Veterans Affairs, DHCP (now known as VistA), that continues to be the the best example of a nationwide EHR system in the United States. I then examine the political and scientific movements that led to the massive push for all healthcare institutions to implement EHRs, beginning with the Institute of Medicine's study, *The Computer-Based Patient Record*, that called for widespread implementation of EHRs, and finishing with a brief overview of the HITECH Act and meaningful use. I then provide a review of the current literature showing the positive and negative effects that EHRs have on patient health outcomes, as well as the effect they have on how physicians interact with patients. I discuss how EHRs reduce certain types of errors, while also increasing other kinds of errors. I conclude with a look into the future direction of the EHR, which will include advanced clinical decision support systems, easy data entry and review, and other systems that will hopefully improve patient health outcomes, patient satisfaction, and efficient use of resources.

Category: Clinical Case Vignette

Treatment Dilemmas of Severe Coronary Artery Disease in a Jehovah's Witness Patient

Darae Ko, MD

Mentors: Melissa Dipetrillo, Eric Awtry

Case: 67 year old woman with insulin-dependent diabetes mellitus, end-stage renal disease not on dialysis, hypertension, hyperlipidemia, non-smoker, Jehovah's Witness was admitted for NSTEMI three times over the course of 7 months. During the first admission, she had two bare metal stents (BMS) placed to left anterior descending artery (LAD), one BMS to obtuse marginal 1 artery (OM1) and one BMS to left circumflex artery (LCx). She was instructed to take aspirin 325mg and clopidogrel 75mg indefinitely. 5 months later, she was re-admitted for non-ST elevation myocardial infarction (NSTEMI), and cardiac catheterization showed 70% proximal LAD in-stent restenosis (ISR), 70% OM1 ISR, 70% proximal LCx ISR, and 100% distal RCA stenosis. The cardiothoracic surgery team declined to perform CABG due to her inability to receive blood products, and the patient was discharged on aspirin 81mg and clopidogrel 75mg. Two months later, she was admitted with NSTEMI complicated by cardiogenic shock requiring multiple inotropes and vasopressors and intra-aortic balloon pump. Her cardiac catheterization showed 95% LAD stenosis, which was stented with a BMS, as well as 70% LCx and 100% OM1 lesions all within the prior stents. She was discharged with a plan to follow-up with a bloodless surgery group, who ultimately declined to operate on her given her high pre-operative risks.

Discussion: This case highlights several important ethical and treatment dilemmas for management of severe coronary artery disease (CAD) in Jehovah's Witness patients. Even though CABG was indicated for this patient, it was not offered due to her inability to receive blood products. CABG can be done in Jehovah's Witness patients if autologous blood transfusion is an acceptable option for the patient or through bloodless surgery. Bloodless surgery involves recovering the patient's blood intraoperatively and re-transfusing into the patient in a continuous circuit. Unfortunately, bloodless surgery was not offered to the patient until later in the course of her illness as it is not widely available. Her severe CAD was managed with percutaneous coronary intervention. She had multiple BMS placed even though BMS have on average 5-fold higher risk of ISR than drug elution stents (DES). This decision was made to minimize the amount of time the patient has to be on dual anti-platelet therapy to reduce her bleeding risk. There have been anecdotes of death in Jehovah's patients from blood loss while on dual anti-platelet therapy.

Category: Clinical Case Vignette

Symptomatic Anemia Caused by Gastric Invasion of Hepatocellular Carcinoma

Ravi Lakdawala MD

Mentor: Melissa Wachterman MD

Background:

Hepatocellular carcinoma is characterized by arterial hypervascularity, usually occurring in the setting of cirrhosis from chronic liver diseases such as Hepatitis C and alcoholic liver disease. Mortality is usually due to liver failure, tumor rupture, and gastrointestinal bleeding by way of esophageal varices. We present a rare cause of morbidity as a consequence of hepatocellular carcinoma.

Case:

A 66-year-old male veteran with a history of hepatocellular carcinoma and emphysema presented for evaluation of progressive dyspnea. At baseline, he could walk one to two miles without shortness of breath, but acutely the week prior to admission, he could only walk three to four steps before having dyspnea requiring rest. He noted some skin pallor and dull abdominal pain, but no associated chest pain, dizziness, leg swelling, fevers, chills or cough. His hepatocellular carcinoma history included resection of a liver mass segment and six transarterial chemoembolizations (TACE), most recently within two months of admission. His other noteworthy medical history included HCV, emphysema, and prior alcohol, tobacco and IV drug dependence. His exam was significant for conjunctival pallor, absence of pulmonary wheezes or rales, a faint systolic ejection murmur and a large palpable liver crossing the midline, without tenderness or ascites. Initial laboratory values include a leukocytosis (55K) with bandemia, severe anemia (Hb 5.9, previously normal), and hypoalbuminemia with normal INR and normal bilirubin. There was no evidence of hemolysis and basic chemistries including kidney function were normal. Imaging of his abdomen was significant for a 7.0 x 8.9 x 7.5 cm necrotic hepatoma arising from the left lobe of the liver, appearing to connect with the gastric lumen. His shortness of breath was attributed to his severe acute anemia, likely from acute gastrointestinal hemorrhage related to the invasion of his hepatocellular carcinoma into the gastric lumen. Unfortunately, there were no surgical treatment options including TACE, local resection or transplantation. Thus, he was treated supportively with blood transfusions and offered outpatient follow-up with medical oncology for the possibility of palliative sorafenib. He was also started on long- and short-acting opioids for pain control and subsequently discharged with home hospice.

Discussion:

Typically gastrointestinal hemorrhage in the setting of hepatocellular carcinoma is due to duodenal ulceration and invasion of the portal vein with subsequent bleeding from esophageal varices. With the expansion of this hypervascular tumor into a local visceral organ, he likely had significant GI bleeds and acute drops in hemoglobin leading to his symptoms, which will likely continue. This significant tumor burden was so severe such that TACE and transplantation were not viable options. Early determination of his prognosis enabled involvement of the Palliative Care service for a discussion of his goals of care. His goals were consistent with a focus on comfort and supportive therapy with blood transfusions to improve his shortness of breath and maximize his functional status. As a result, the palliative care service also helped mobilize hospice services. Control of his pain, caused by liver capsular stretch, was achieved with long- and short-acting opioids. Though sorafenib is a systemic treatment with the possibility to improve his morbidity, in the outpatient setting, the patient opted not to pursue this treatment.

Examination of factors to predict adherence to endoscopic surveillance follow up in a cohort of patients with biopsy proven Barrett's esophagus.

Authors: Helen Lee, Supriya Rao, Brian Jacobson

Background: Barrett's esophagus (BE) is a premalignant condition where cells of the distal esophagus transform from stratified squamous epithelial cells to metaplastic columnar epithelial cells in the presence of risk factors such as chronic reflux disease. The American Gastroenterological Association (AGA) recommends endoscopic surveillance at specific time intervals to ensure timely intervention prior to progression to cancer. However, adherence to AGA's endoscopic surveillance recommendations is poor in the community. In searching the literature on PubMed, there have been few studies looking at factors affecting rate of adherence to endoscopic surveillance. This quality improvement project will focus on determining the rate of adherence among BE patients at Boston Medical Center and factors that may predict poor follow up.

Methods: We started with a list of 1005 patients who had the keywords "Barrett's esophagus" in their upper endoscopy reports performed between January 2000 and June 2013 at BMC. Our primary outcome was non-adherence to endoscopic surveillance schedule recommended by AGA (upper endoscopy with biopsy within past 3 years). Our secondary outcomes include differences in patient demographics, clinical and practice factors. Chi-square testing was used to determine if there are any statistically significant differences between patients with BE on biopsy who adhered to AGA recommended endoscopic surveillance schedule and patients with BE on biopsy who did not. Regression analysis was used to determine correlation between our secondary outcomes and poor adherence to endoscopic surveillance.

Results: The results are based on preliminary analysis. Only patients ages of 18 and older who had biopsy proven BE (459/1005) were included in the study. This cohort of patients were mostly Caucasian males (73.6% males, 74.3% Caucasian). Within the cohort, 40% used Medicare, 13.9% used Medicaid, 45.1% utilized the healthcare system at least once in the past one year, and 51% had BE on their problem list. On retrospective chart review, we learned that 245 (53.4%) of the 459 patients were not up to date with their endoscopic surveillance per AGA guideline, defined as EGD within the past 3 years. Based on a preliminary analysis of our data, patients were more likely to be up to date in their endoscopic surveillance if BE is listed in their problem list, if there is healthcare utilization, if a tracking result letter is used, and if patients had long versus short segment BE segment. There was no association with race or gender.

Conclusion: Adherence to endoscopic surveillance in our cohort of biopsy proven BE patients is similar to rates seen in previous studies. Based on our results, improved closed loop communication between the endoscopist, the patient and the patients primary care provider may help improve adherence to endoscopic surveillance for our BE patients. Our study is limited by the fact that not all of the BE patients' charts were complete and some of them received their primary care at outside facilities.

Category: Senior Talk Abstract

Workload-based Medical Service Flow Models

Steve Y. Lee, MD

Mentors: David Thornton MD, Anand Kartha MD – Dept of Internal Medicine, West Roxbury VA

The implementation of ACGME duty hour rules have forced changes to the traditional team-based rotating call schedule historically adopted by internal medicine teaching programs. Further, between-team inequalities in daily workload hamper both education and patient care, as unlucky teams are required to perform unequal amounts of work in fixed periods of time. In this presentation, I describe a novel admitting paradigm based on anticipated real-time team workload, as measured by time; **specifically, the admitting team with the lowest calculated workload at a given time gets the next patient assignment.** With precedents drawn from industrial engineering, and to a lesser extent, nurse staffing, these systems more efficiently match staffing with anticipated workload, reducing duty hour violations (or overtime pay) while avoiding overstaffing on low-volume days.

This system is demonstrated in the context of the medical service at the West Roxbury VA campus, a 5-team traditional call system persistently plagued by duty hour violations, particularly on “long call” days. A historical review of 2013 VA Boston admission found that 52% of admissions occurred between 3pm and 7pm, often overwhelming housestaff at times of the day with fewest number of admitting teams. Further this system led to significant day-to-day team census inequality, complicating efficient patient discharges by overworked teams.

In collaboration with VA Systems Redesign Engineers, we used 5 days of historical patient admission and discharge data from 2013 April 22-26 to simulate eight models and their anticipated effects on housestaff workload and duty hour effects. Task-based workload was determined by 3 strategies: 1) directly-observed intern activity by stopwatch, 2) survey of interns, 3) regression analysis of historical patterns. Final values were determined by matching the best of these values to actual intern practices. Using these time values, 8 admitting scenarios were created. Salient among these were Model A: status quo “batting order”; Model B: all teams admit until 7pm with lightest workload team getting the next patient; Model C: 3 teams admit until 7pm; Model D: 3 teams admit, with admission caps; Model E: all teams admit in a specified order unrelated to workload. Scenarios were simulated with data from April 22-26 to determine anticipated intern duty hour violations, average intern time-in-hospital.

Calculated workloads were 144 minutes for new admissions, 41 minutes for existing patients, 69 minutes for transfer admission, 34 minutes for overnight admission, and 75 minutes for discharge. Simulations revealed maximum anticipated duty hour violations (5 of 5 days) for Model A, traditional “batting order,” and fewest (0 of 5 days) for Models B and E, scenarios in which all teams admit until 7pm. Conversely, Models B and E corresponded with the latest average out-the-door time, while Model A was earliest. Model C, with three teams admitting, resulted in minimal anticipated duty hour violations (1 of 5 days), while avoiding excessive intern time-in-hospital.

Simulations suggest that systems in which 5 teams admit daily allocate excessive workforce for VA Boston; however, hybrid Model C with 3 teams admitting in a workload-based manner minimized duty hour violations while getting interns home at reasonable times. Limitations to these simulations include the short study period, conflicts with ACGME team caps, and individual workarounds - despite daily anticipated duty hour violations in the present system, these don’t always occur. Further investigations would apply workload-based flow models in actual practice, allowing assessment of the effects of more equitable workload in education and patient care.

Category: Clinical Research

Costs and Outcomes in Stage IV Non-small Cell Lung Cancer at an Urban Safety Net Hospital

Mentor: Kevan Hartshorn

Authors: Julian Lel, Edmund Folefac, Kevan Hartshorn

Background: Stage IV non-small cell lung cancer (NSCLC) is an incurable illness with a rapidly progressive course and significant morbidity. Chemotherapy has been shown to prolong average survival from 6 to 10 months. Newer and expensive targeted therapies such as tyrosine kinase inhibitors and monoclonal antibodies may further reduce morbidity and prolong survival. These advances pose financial and other challenges for safety net hospitals, which care for the poor and underserved. We aimed to address the paucity of data on outcomes and treatment costs of Stage IV NSCLC in this unique population.

Methods: A chart-based retrospective review was conducted on all patients diagnosed with Stage IV NSCLC between 2005 and 2011 at Boston Medical Center, an urban safety net hospital. Data were collected on survival from time of diagnosis, type and duration of treatment, utilization of healthcare resources including all outpatient, emergency and inpatient visits, drug costs, radiographic studies and labs, as well as detailed personal characteristics such as age, gender, race, homelessness and English language proficiency. Costs of treatment for each patient were derived from actual billing data, when available, as well as from estimates. We assessed the effect on survival of treatment and patient characteristics by calculating hazard ratios. We examined total and itemized costs as a lump sum and as cost per month.

Results: A total of 198 patients were analyzed after excluding 23 patients that died within 30 days of diagnosis. 110 (56%) were male. 113 (57%) were white, 63 (32%) were black, 11 (6%) were Hispanic. 21 (11%) had been homeless. 113 (57%) did not receive any anti-neoplastic therapy, 48 (24%) received only cytotoxic chemotherapy, 35 (18%) received cytotoxic and targeted therapy. The median survival was 5.0 months without pharmacotherapy, 7.0 months with cytotoxic chemotherapy only and 9.2 months with cytotoxic and targeted therapy. Controlling for treatment type, hazard ratio of death for white patients was 0.683 relative to non-white patients. Median total and monthly costs for patients on no anti-neoplastic therapy were \$70,000 and \$14,000, for patients on cytotoxic chemotherapy only were \$112,000 and \$19,000 and for patients on cytotoxic and targeted therapy were \$247,000 and \$26,000. Controlling for homelessness, costs per month of survival of white patients were \$12,000 less than for non-white patients. Controlling for race, costs per month of survival of homeless patients were \$15,000 more than for non-homeless patients.

Conclusions: The majority of patients did not receive anti-neoplastic therapy despite a robust survival gain associated with its use, suggesting barriers to therapy in our population. Untreated patients nevertheless incurred a high cost of care. Care for homeless patients was especially costly. White patients showed better survival at a lower cost for unclear reasons. Potential interventions in this population include identifying and addressing barriers to anti-neoplastic therapy and early referral to palliative and home-based care in patients not suitable for treatment. Continued efforts to understand and address a dramatic racial disparity are also warranted.

Category: Senior Talk Abstract

Herxing for a Cure: The Story of Chronic Lyme Disease

Shane Magee, MD

Abstract: Since its discovery, lyme disease has been shrouded in controversy. To paraphrase the IDSA guidelines, many patients attribute the aches and pains of everyday living to chronic lyme disease. On the other side of the controversy lies the patients and their advocates who see the IDSA as callous and hobbled by the reliance on high quality trials when patients are suffering today. How did this situation come to pass? My talk seeks to answer this question by both analyzing the recent discovery of lyme disease and its categorization as an infectious pathogen through Koch's postulates and comparing it to the concurrent discovery of HIV. Additionally, I briefly comment on the cultural milieu in which these discoveries were made and cite concrete examples in the courts and the press before discussing recent evidence both in favor of and against the diagnosis of chronic lyme disease. Throughout my talk I focus on the impact of and the interaction between the lay and medical perceptions of disease. In conclusion, I illustrate a framework in which to understand this disease process which is similar to both fibromyalgia and chronic fatigue syndrome.

Beta-Blockers in End Stage Renal Disease: A Systematic Review

Patrick K McGlynn, David Flynn, Julia Whelan, Ashish Upadhyay

Introduction:

The mortality rate in dialysis patients is 30 times higher than the general population. 60% and 26% of these deaths are due to Cardiovascular (CV) Disease and sudden cardiac death (SCD) respectively. Given the burden of CV disease and the association of the sympathetic nervous system (SNS) with mortality, it seems reasonable that treatment with a beta-adrenergic blocker would confer cardio-protection similar to what is seen in post-MI and Heart Failure patients. As dialysis patients are excluded from most large trials, we performed a systematic review to assess a relationship between beta-blocker use and SCD, CV mortality, all-cause mortality and CV events in patients on hemodialysis (HD) and peritoneal dialysis (PD).

Methods:

We searched the Medline, Web of Science, and Cochrane databases from inception until July 1, 2013 with a pre-defined search criteria. Bibliographies from relevant search results were reviewed for articles to be considered for inclusion. The Medline, Web of Science and Cochrane database searches yielded 792 articles, 3,171 articles, and 0 articles respectively. After reviewing bibliographies an additional 250 articles were identified for review. All together, the search yielded a total of 4,213 articles.

Results:

Of the 4,213 abstracts, 608 were selected for full text review and 31 were included in the final analysis. Of these papers there were: 4 randomized controlled trials (RCT), 22 cohort studies, 2 case control studies, and 1 case series. Only one of the RCTs was available for full review. The other three were only available as abstracts. Given the size and heterogeneity of the studies a quantitative meta-analysis was not performed. All but one of the RCT's that were reviewed demonstrated decreased cardiac events. 8 of the cohort studies demonstrated a significant reduction in either SCD, CV mortality, all-cause mortality or in CV events. Another 8 displayed an insignificant trend in these end-points. The case series had a significant reduction in SCD with beta-blocker administration, and the retrospective analysis of the RCTs did not observe benefit in any of the studied outcomes.

Conclusion:

Despite positive results in many studies, they are not consistently replicated in observational studies. Given the high burden of disease in this patient population with poor clinical outcomes it would be reasonable to use beta-blockers where indicated in the general population, but additional RCT's are warranted to further confirm.

Limitations:

Limitations of this study include the lack of full text available for 3 of the 4 RCTs, publication bias, and heterogeneity of the studies.

Category: Clinical Case Vignette

Mending a Broken Heart Through Palliative Care

Authors: Jordana L. Meyerson, M.D. and Sandhya Rao, M.D., Department of Medicine, Boston University School of Medicine

Introduction: Heart failure brings significant emotional and physical distress to patients at the end of their lives. The role of Palliative Care and hospice in patients with this condition has not been fully elucidated but these services can provide significant benefit to this patient group.

Case description: A 31-year-old incarcerated woman with a history of recurrent intravenous drug use and endocarditis requiring mitral valve replacement presented to the hospital with four days of shortness of breath, chest pain, back pain, and lower extremity edema. She was diagnosed with a heart failure exacerbation and transthoracic echocardiogram confirmed severe mitral and tricuspid valve regurgitation. Diuresis was difficult to achieve and expert opinion was that she required repeat valve replacement surgery. She was deemed to not be a surgical candidate, however. She continued to have palpable suffering due to physical, emotional, and spiritual pain. She was amenable to meeting with our Palliative Care team who elucidated further details on symptoms she was experiencing of poor appetite, nausea, insomnia, depression, and anxiety. Through various conversations with the Department of Corrections, she was granted more freedoms and visitors while inpatient but continued to suffer from emotional and physical pain. Our Palliative Care consultants orchestrated a family meeting in which the patient's goals were clearly communicated and she was transitioned to a comfort-focused approach. She was subsequently subjectively and objectively noted to be more comfortable and less anxious. She was discharged with a comfort-focused care plan to a facility within the prison system. However, after discharge she was referred to another hospital for consideration of valve replacement. Her case was again declined and she died a few days later.

Discussion: This case illustrates the utility of Palliative Care services in the management of physical and psychosocial symptoms associated with heart failure. It also highlights the importance of communication at transitions of care for patients with a palliative or hospice-related care plan.

Category: Clinical Case Vignette

Radiofrequency Ablation as a Novel Treatment for Gastric Antral Vascular Ectasia with Follow Up Using Optical Coherence Tomography.

Harini Naidu, M.D., Hsiang-Chieh Lee, Hiroshi Mashimo, M.D., Ph.D

Introduction: Gastric Antral Vascular Ectasia (GAVE) is an obscure source of nonvariceal upper GI bleeding associated with various systemic diseases such as connective tissue disorders, liver disease, and chronic renal failure. Successful treatment of GAVE continues to be a challenge and has evolved through the years. Currently, endoscopic ablative modalities have largely usurped medical treatments as first-line therapy, particularly the use of argon plasma coagulation or newer modalities, such as radiofrequency ablation (RFA). Optical Coherence Tomography (OCT) is an emerging imaging modality, which uses backscatter of light waves to generate 3-dimensional images of submucosal structures. It has been adapted in the analysis of gastrointestinal disease such as Barrett's esophagus and esophageal adenocarcinoma. Here, we report a case of GAVE treated with RFA and the novel use of optical coherence tomography (OCT) for post-procedure assessment of changes.

Case: A 66 year old male with a past medical history of renal cell carcinoma s/p left nephrectomy in 2010, chronic alcohol use, and tobacco use, was incidentally found to have iron deficiency anemia in the setting of fatigue for the past several months. Upon further questioning, patient endorsed exacerbated symptoms with exertion, but denied chest pain, palpitations, or dyspnea. In addition, patient denied nausea, vomiting, abdominal pain, hematochezia, melena, bruising, other sites of bleeding, constipation, diarrhea, increased abdominal distension, early satiety, weight loss, fever, chills, night sweats, sick contacts, or recent travel. Physical exam was notable for pale conjunctiva, but otherwise unremarkable. CBC and iron studies showed mild iron deficiency anemia. Given this presentation in the setting of prior malignancy, he was referred to Gastroenterology for further workup. Colonoscopy was unremarkable. EGD was notable for longitudinal collections of ectatic vessels in the gastric antrum without active bleeding, and biopsies showed the presence of microthrombi staining positively for CD61 consistent with the diagnosis of gastric antral vascular ectasia (GAVE). Given the broad area of vascular changes and recent pilot studies showing efficacy of RFA in the treatment of GAVE, the patient underwent RFA with endoscopic surveillance at 6 month intervals post-treatment. An ultrahigh speed endoscopic OCT system was used to investigate the changes in gastric mucosa of GAVE before and after the RFA treatment. OCT images of the pre-treatment gastric mucosa revealed features rich of dilated glands with irregular size and orientation, attributed to the ectatic vessels underneath the epithelium. In comparison, OCT images of the post-treatment gastric mucosa exhibited a regular vertical pits pattern, and also identified the boundary between the lamina propria and muscularis mucosa (~800um beneath tissue surface), suggesting features of normal gastric mucosa.

Discussion: There is a lack of consensus regarding the optimal endoscopic modality for the treatment of GAVE, largely due to the very small number of head-to-head comparative studies among these modalities to date. While APC (argon plasma coagulation) is generally thought to be the gold standard based on the relatively large amount of data available, new treatment modalities, such as RFA, show promising results in pilot studies. The use of RFA may be beneficial for more diffuse cases of GAVE, similar to experiences in treatment of chronic radiation proctocolitis. RFA may be more suited for ablation given its broader treatment field and more controlled uniform superficial ablation, which may conceivably avoid ulcerations and strictures. Whether such superficial treatments are adequate in impacting the deeper submucosal vascular network of GAVE remains to be seen in future large controlled trials with longer follow up periods. In this study, visible improvement was noted in the endoscopic appearance of the gastric mucosa after RFA treatment. These findings were then confirmed with high-resolution OCT, showing resolution of abnormal submucosal patterns corresponding to GAVE. As a result, the uncertainty of adequate submucosal vessel ablation with RFA may potentially be addressed objectively with this modality.

Conclusion:

RFA appears to be a viable alternative treatment for GAVE given the improvement in the gross appearance of gastric mucosa. High resolution endoscopic OCT may be used as an objective measure to assess subsurface improvement and the efficacy of RFA treatment.

Category: Senior Talk Abstract

Obesity and Cardiovascular Disease

Edmond Obeng-Gyimah, M.D. and Flora Sam, M.D.

Cardiovascular disease is the number one killer in the world and obesity is a leading modifiable risk factor of cardiovascular disease. More than one-third of U.S. adults (35.7%) are obese and 68% are overweight or obese¹. This has and continues to have major implications on health as well economic costs from loss of life and productivity². Excess fat has effects on the cardiovascular system either as a major contributor to the metabolic syndrome or as emerging evidence suggests by itself^{3, 4}. Contrary to formal thought, adipose tissue is not inert but rather a metabolically active organ producing various adipokines with targeted effect on the body. Investigation into adipose biology and mechanisms of obesity has gained momentum as new ways are being sought to combat the obesity epidemic. In January 2000, the Department of Health and Human Services launched *Healthy People 2010*, a comprehensive, nationwide health promotion and disease prevention agenda. In addition to no single state being able to achieve a 15% reduction in obesity set forth by this initiative, there was in fact an increase in the number of states with obesity⁵. In 2000, no state had an obesity prevalence of $\geq 30\%$. However by 2009, nine states had obesity rates of $\geq 30\%$ with a further increase to 12 states in 2010. These numbers highlight the extraordinarily rapid increase in the prevalence of obesity and the impact of its strong association with cardiovascular disease. This has resulted in an unprecedented need to understanding the effects of obesity on the cardiovascular system. This chapter will discuss the direct and indirect effects of obesity on the cardiovascular system, and its impact on morbidity and mortality.

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Category: Senior Talk Abstract

Fecal Microbiota Transplantation: Current and Novel Therapeutics

Taha Qazi, M.D.

The role of the gut microbiome in health and disease has only recently being elucidated. Recent studies have suggested that commensal organisms within the gastrointestinal tract are instrumental in nutrient acquisition, metabolism, competitive exclusion of pathogenic organisms, and the maturation of the immune system. The success of fecal transplantation in the treatment of recurrent *Clostridium difficile* has been previously been described and was illustrated in a recent randomized controlled trial. The goal of the senior talk is to present an overview on the use of fecal microbiota transplantation (FMT) in the successful treatment of not only gastrointestinal diseases but also non-gastrointestinal diseases through a review of current literature. Specifically, the use of fecal transplantation in inflammatory bowel disease and the successes associated with FMT in inducing remission and improving symptoms as well as the use of FMT in non-gastrointestinal diseases such as multiple sclerosis, chronic fatigue syndrome, immune mediated thrombocytopenia, and diabetes.

Category: Clinical Research

Two Decades of Mortality Trends Among Patients with Severe Sepsis: a Comparative Meta-Analysis

Gregory Radin, M.D.

Stevenson EK, Rubenstein AR, Radin GT, Wiener RS, Walkey AJ.

Introduction:

Trends in severe sepsis mortality derived from administrative data may be biased by changing International Classification of Diseases, 9th Revision, Clinical Modification, coding practices. We sought to determine temporal trends in severe sepsis mortality using clinical trial data that does not rely on International Classification of Diseases, 9th Revision, Clinical Modifications coding and compare mortality trends in trial data with those observed from administrative data.

Methods:

We searched MEDLINE for multicenter randomized trials that enrolled patients with severe sepsis from 1991 to 2009. We calculated standardized mortality ratios for each trial from observed 28-day mortality of usual care participants and predicted mortality from severity-of-illness scores. To compare mortality trends from clinical trials to administrative data, we identified adult severe sepsis hospitalizations in the Nationwide Inpatient Sample, 1993-2009, using two previously validated algorithms.

Results:

Of 3,244 potentially eligible articles, we included 36 multicenter severe sepsis trials, with a total of 14,418 participants in a usual care arm. Participants with severe sepsis receiving usual care had a 28-day mortality of 33.2%. Observed mortality decreased 3.0% annually (95% CI, 0.8%-5.0%; $p = 0.009$), decreasing from 46.9% (standardized mortality ratio 0.94; 95% CI, 0.86-1.03) during years 1991-1995 to 29% (standardized mortality ratio 0.53; 95% CI, 0.50-0.57) during years 2006-2009 (3.0% annual change). Trends in hospital mortality among patients with severe sepsis identified from administrative data (Angus definition, 4.7% annual change; 95% CI, 4.1%-5.3%; $p = 0.69$ and Martin definition, 3.5% annual change; 95% CI, 3.0%-4.1%; $p = 0.97$) were similar to trends identified from clinical trials.

Conclusion:

Since 1991, patients with severe sepsis enrolled in usual care arms of multicenter randomized trials have experienced decreasing mortality. The mortality trends identified in clinical trial participants appear similar to those identified using administrative data and support the use of administrative data to monitor mortality trends in patients with severe sepsis.

Category: Clinical Research

Serum Anti-Phospholipase A2 Receptor Antibody Testing for Idiopathic Membranous Nephropathy

Vinod Raman, MD, Craig E. Gordon, MD, Laurence H. Beck, MD, PhD, Jean M. Francis, MD. Renal Section, Dept of Medicine, Boston Univ School of Medicine, Boston, MA.

Background: Idiopathic membranous nephropathy (IMN) is diagnosed in 16-33% of kidney biopsies for nephrotic range proteinuria in adults. Anti-phospholipase A2 receptor antibody (anti-PLA2R) has been associated with idiopathic membranous nephropathy. The performance characteristics of the available diagnostic tests for anti-PLA2R have not been well defined. Using systematic review and meta-analysis, we aimed to identify the role of anti-PLA2R testing as a diagnostic tool for IMN in patients with nephrotic range proteinuria.

Methods: We performed a systematic review of the literature using Medline to identify studies reporting the use of serum anti-PLA2R as a diagnostic test for IMN in patients with nephrotic range proteinuria and biopsy confirmation of IMN. From reported data, we calculated the sensitivity and specificity for serum anti-PLA2R testing against reference standard of biopsy. IMN incidence data was used to estimate the positive and negative predictive values (PPV, NPV).

Results: Of 1125 retrieved studies, 10 studies provided data that allowed the calculation of sensitivity and specificity for serum anti-PLA2R testing. The 10 studies reported on total 620 unique patients with nephrotic range proteinuria. Patients had a mean age of 49.5 years, 50% were male, mean proteinuria was 7.9g/g, and mean serum creatinine was 1.07mg/dl. Six studies used western blot and four used immunofluorescence to detect anti-PLA2R.. Sensitivity of anti-PLA2R testing ranged from 66-98% and specificity from 84-100%. Using the median value of IMN incidence in patients with nephrotic range proteinuria obtained from published literature (23%), PPV and NPV ranged from 92%-100% and 78-96%, respectively.

Conclusions: Our findings indicate that serum testing for anti-PLA2R is an important diagnostic tool in the evaluation of patients with nephrotic range proteinuria with a high sensitivity, specificity, and at expected incidence levels, a high positive and negative predictive value for IMN.

Category: Senior Talk Abstract

NAFLD: The Next Great Challenge in Liver Disease

Author/speaker: Vikram Rangan

Mentor: Dr. Robert Lowe

Non-alcoholic fatty liver disease (NAFLD) is a common condition whose worldwide incidence is expected to grow as the prevalence of global obesity continues to increase. My senior talk began by discussing the public health implications of NAFLD. I noted, for example, that in the US alone, approximately 60 million adults are thought to be currently afflicted, and that NASH (a variant of NAFLD) is projected to be the leading indication for liver transplant by the year 2020.

Having established the clinical relevance of NAFLD, I then discussed the differences (both histologic and clinical) between simple steatosis and NASH. Both of these conditions fall under the NAFLD spectrum, but they carry far different prognoses; simple steatosis is generally considered to be a benign condition, whereas NASH is associated with significantly increased all-cause mortality and progression to cirrhosis. I discussed various non-invasive tools currently available to distinguish these two conditions, including specialized imaging modalities designed to evaluate for liver fibrosis (such as Fibroscan ultrasound and MR elastography), and various mathematical models (such as the NAFLD fibrosis score) using commonly available clinical data to predict whether fibrosis is present. One novel test that evaluates directly for hepatocellular inflammation and necrosis (rather than liver fibrosis as a proxy for inflammation) is serum levels of CK-18, a hepatocyte cytoskeleton protein that is released into the bloodstream with hepatocyte necrosis. Though not yet widely commercially available in the US, CK-18 levels have demonstrated a sensitivity and specificity of greater than 85% in detecting NASH. Having detailed currently available noninvasive modalities of distinguishing NASH from simple steatosis, I briefly discussed the role of liver biopsy, noting that there are currently no definitive indications for it based on current guidelines, and that it should only be pursued in cases where there is significant uncertainty about whether NASH is present (despite the various noninvasive tools discussed above), or where there is concern over cirrhosis.

The final part of my talk focused on currently available treatments for NAFLD. I began by noting that weight loss is the most efficacious existing treatment, and that the degree of weight loss is correlated with the degree of histologic improvement of NAFLD. I then discussed several clinical trials investigating pharmacologic treatments, and noted that there are currently three treatments that have demonstrated a beneficial effect on NAFLD activity in RCTs: Vitamin E, Pioglitazone, and Pentoxifylline. Of these three, Vitamin E is currently considered to be the first line treatment, per current American Gastroenterology Association (AGA) guidelines, although concerns have been raised over this medication possibly increasing all-cause mortality. Other treatments, such as Metformin and Ursodeoxycholic Acid (UDCA), have been the subject of RCTs in NASH patients, but have not demonstrated any improvement in liver histology. Numerous other treatments such as statins, Omega 3 fatty acids, Losartan, and Orlistat have been suggested as treatments, but lack RCT data thus far. There are also multiple potential therapies in phase 2 and 3 trials presently, which are designed to specifically act on hepatic inflammatory pathways (however, none are expected to be available before 2016-2017). While current treatment options for NAFLD are limited, I concluded my talk by reflecting that it is still an important entity to be aware of in the clinical setting, as there are still tangible measures that can be undertaken to improve the prognosis and clinical course of those afflicted by it.

Category: Senior Talk Abstract

I'm Just Covering!?: Ironing Out the Kinks in Transitions of Care

Amanda Rubenstein, M.D.

Due in part to greater limitation of resident duty hours, medical care has become increasingly fragmented, leading to more frequent transitions of care. From their first week of training, medicine interns give signout nightly, often with little formal education or guidance from senior residents or faculty. Indeed, the signout process itself has been implicated as a major source of preventable adverse events. A landmark article by Peterson published in 1994 showed that inpatients suffering preventable adverse events were 6.1 times more likely than matched controls to be under the care of a cross-covering physician at the time of the event. As such, the ACGME, Joint Commission and WHO have each advocated for standardization of and greater education on signouts. In an effort to identify issues with signout that lead to adverse events, two separate research teams (Arora, et al.; Horwitz, et al.) conducted interviews with medical residents who had just completed a night of cross-coverage, asking these residents to identify any preventable adverse events or other unexpected events. They also asked the residents to identify issues with the signout they received that might have left them ill-prepared to respond to the adverse or unexpected event. 75% of the signout issues identified were classified as content omissions, while the other 25% were non-content issues (e.g., environmental factors, communication modality). Of the former 75%, most dangerous omissions were those relating to contingency plans (i.e., what tasks the covering resident should carry out, dependant upon the patient's condition). Of the remaining 25% of issues (i.e., the non-content issues), the most commonly cited were interruptions during the signout process, telephone-based signout (in contrast to in-person signouts), and insufficient time for questions and answers. To address these issues, a variety of signout interventions have been proposed and fielded, including tools such as signout mnemonics, computer-based signouts, specialized rooms for signout and curricula for signout education. However, only one study (Starmer, et al.) has shown a reduction in preventable adverse events (in a pediatric medical/surgical unit) after institution of a signout "bundle," consisting of a two hour educational component, computerized handoff tool, and faculty member involvement in resident to resident signout. More interventions are required to promote awareness about transitions of care and standardize the hand-off process both nationally and at Boston Medical Center.

Category: Clinical Research

The Fate and Reliability of Endoscopy Research Presented at Digestive Disease Week

Rubin, Jonah N.¹; Atkinson, Christopher D.¹; Viana, Artur¹; Neviackas, Jordan¹; deHaan, Kevin¹; Shergill, Karanpreet¹; Eisen, Glenn M.²; Jacobson, Brian C.¹

1. Boston University Medical Center, Boston, MA, United States. 2. Oregon Health and Science University, Portland, OR, United States.

Background: Data presented at medical conferences represent a range of entities from pilot studies to interim analyses to data ready for publication in peer-reviewed journals. We sought to understand how often endoscopy research findings presented in abstract form at Digestive Disease Week (DDW) are ultimately published as full-length articles and how frequently data and conclusions change after peer-review.

Methods: Since 2004, the journal *Endoscopy* has published review articles summarizing those abstracts considered the best or most interesting among various endoscopic topics at each year's DDW. We collected these highlighted abstracts from 2004-2007 (to permit at least five years of follow-up through 2012) and then employed a search strategy to find published, full-length manuscripts resulting from each abstract. We searched the online PubMed database for each abstract's title and first and last authors from May 2004 through November 2013. We randomly selected 37 authors whose abstracts were considered "never published in full manuscript form" and contacted those authors to check how often our search strategy missed a publication. Only 5 (14%) provided evidence of a publication consistent with the original abstract. We then reviewed all resulting manuscripts to determine how often data and conclusions presented at DDW changed after peer-review. We employed logistic regression to identify factors associated with eventual publication and alteration of data and conclusions. This study was authorized by the Boston Medical Center IRB.

Results: We reviewed all 847 abstracts that were highlighted in the journal *Endoscopy*. Of these abstracts 592 (70%) were poster presentations and 255 (30%) were oral presentations. Only 408 (48%) abstracts were eventually published as original articles in peer-reviewed journals. The mean number of years to publication was 1.72 (SD 1.5) among those abstracts eventually published. The data presented at DDW changed in 264/408 (65%) published articles and the study's conclusion changed in 91/408 (22%) of published articles. Abstracts given as oral presentations at DDW were more likely than poster presentations to be published as a full manuscript (OR 2.08; 95%CI 1.54-2.80) as were studies initially published in *Gastroenterology's* abstract book compared to *Gastrointestinal Endoscopy* (OR 1.63; 95%CI 1.14-2.34). Increasing years to publication were significantly associated with changes in data (OR 1.79 for each additional year, 95%CI 1.46-2.18) and conclusion (OR 1.33 for each additional year, 95%CI 1.12-1.57).

Conclusion: Many endoscopy research findings presented at DDW are never published in full manuscript form. Even when published, the research findings and conclusions may change after peer-review. Clinicians may want to refrain from altering their endoscopic clinical practice based solely on abstracts presented at DDW.

Category: Quality Improvement Research

Reducing 30 Day Readmission Rates for Acute Myocardial Infarction with Psychosocial Risk Assessment

Tamanna K. Singh, M.D., Harpaul Sandhu, M.D., Deepa Gopal, M.D., Omar Siddiqi, M.D., Ankur Karnik, M.D., Lana Kwong, M.P.H., James Palatty, Pharm.D., Man Lam, Pharm.D., Deborah Whalen RNP, MSN, ANP-BC, Lindsay M. Arnold Pharm.D., BCPS, Eric Awtry, M.D., George Philippides, M.D.

Introduction: BMC's Acute Myocardial Infarction (AMI) all-cause 30-day readmission rate for Medicare patients from 7/1/2008-6/30/2011 was identified by the Center for Medicare and Medicaid Services (CMS) to be higher than the national average (23.7% vs. 19.7%) leading to a 1% financial penalty to the base fiscal year (FY) 2013 medicare reimbursements to BMC. This financial penalty increases to 2% for FY 2014 and 3% for FY 2015. This study was designed to determine whether identifying at least 2 of 8 psychosocial risk factors at admission and implementing an intensive pre-discharge process to address these factors would lead to a sustainable process that would improve BMC's performance at or better than the national average for AMI all-cause 30-day readmission rates for medicare patients.

Methods: The A3 process was used to outline the initial state, target state, and gap analysis in order to create an approach that would meet the objective.

Inclusion Criteria: Medicare patients admitted for ST-Elevation Myocardial Infarction (STEMI) and World Health Organization (WHO) Type 1 Non-ST-Elevation Myocardial Infarction (NSTEMI) to BMC's General Cardiology, Cardiomyopathy (CMY), and Coronary Care Unit (CCU) Teams

Exclusion Criteria: Patients with NSTEMI likely secondary to systemic illness or metabolic disturbances (WHO Type 2 NSTEMI)

A stepwise intensive pre-discharge plan was implemented for all eligible patients who were identified as patients at high risk for readmission if they possessed at least 2 of 8 psychosocial risk factors outlined on the High Risk Readmissions Checklist.

Results: Within just three months of implementation, this intervention has reduced the percent of patients readmitted within 7 days and 30 days from 8.11% and 16.22% respectively (May 2012 through July 2012) to 0% and 3.57% respectively (May 2013 through July 2013). We have also identified that the predominant psychosocial risk factor for patients is having 6 or more medications at time of admission, thus supporting the need for pharmacist intervention alongside physician/nurse practitioner/social work/case management intervention.

Discussion: Although this intervention has only been in place for three months, our analysis suggests that by identifying psychosocial risk factors upon admission for AMI and implementing a pre-discharge process to address these factors, the AMI readmission rate can be significantly reduced. By continuing to apply this intervention, BMC's performance is anticipated to be better than the national average for AMI all-cause 30-day readmission rate for medicare patients, thus preventing future financial penalty.

Category: Clinical Research

Phenotypic Manifestations of Inflammatory Bowel Disease in Patients of Haitian and Cape Verdean Descent

Christopher G. Stallwood¹, Karenpreet S. Shergill², Joseph M.W. Wu³, Francis A. Farraye¹, Hannah L. Miller¹

1. Section of Gastroenterology, Boston Medical Center, Boston University School of Medicine, Boston MA

2. Department of Epidemiology, School of Public Health, Boston University, Boston MA

3. Department of Biostatistics, School of Public Health, Boston University, Boston MA

Background and Aims: Several studies have reported unique phenotypes of inflammatory bowel disease (IBD) in certain ethnicities. A better understanding of the disease manifestations in different patient populations may improve clinical outcomes. There are no major studies examining IBD in patients of Haitian or Cape Verdean descent. We sought to define the IBD phenotype in these ethnic groups.

Methods: This was a retrospective study comparing IBD patients of Haitian and Cape Verdean ethnicity to Caucasians. The following variables were analyzed: family history, smoking history, vaccinations and cancer screening, age of diagnosis, duration of disease, disease location, medication use, and complications of disease.

Results: There were 31 Haitians and 21 Cape Verdeans matched to 52 Caucasian controls. Haitian/Cape Verdean patients were diagnosed with IBD at a later age than Caucasians (42 years vs. 34 years, $P<0.05$). Haitians/Cape Verdeans were also less likely to have a history of tobacco use compared to Caucasians (18% vs. 44%, $P<0.05$). Among patients with Crohn's Disease, Haitian/Cape Verdean patients were less likely to have perianal disease compared to Caucasians (13% vs. 50%, $P<0.05$). The prevalence of glucocorticoid use was lower in Haitians/Cape Verdeans compared to Caucasians (54% vs. 76%, $P<0.05$), but there was no difference in other medication use. There was no difference in vaccination rates, skin cancer screening, and medical or surgical complications.

Conclusions: This study demonstrates differences in IBD presentation and disease course among Haitian and Cape Verdean patients. Future studies are needed to identify the influence of environmental factors on disease presentation.

Category: Clinical Research

Nationwide Variability of Colonoscopy Preparation Instructions

Loc Ton MD, Helen Lee MD, Pushpak Taunk MD, Audrey H. Calderwood MD and Brian C. Jacobson MD, MPH

Background: Patients undergoing colonoscopy are typically provided preparation instructions. However, these are not standardized for type of bowel purgative, dietary restrictions or management of prescription and non-prescription medications.

Aim: We sought to examine the degree of variability in colonoscopy instructions across the United States.

Methods: We collected colonoscopy preparation instructions from endoscopy units that successfully participated in the American Society for Gastrointestinal Endoscopy's Endoscopy Unit Recognition Program (EURP). Descriptive statistics were used to describe the variability in bowel preparation, dietary restrictions, medication instructions and other patient advice.

Results: Preparation instructions were available from 201 (49%) of 411 EURP units. Split-dosing of bowel purgatives was used by 82% of practices, although 79 units (39%) offered instructions for both single- and split-dose regimens and 18% of units relied only on single-dose regimens. Patients were restricted to a clear liquid diet on the day prior to colonoscopy by 91% of practices, but other specific dietary instructions (such as avoidance of nuts or legumes) varied. Instructions for the management of anti-thrombotic and anti-platelet agents, non-steroidal anti-inflammatory drugs and diabetes medications varied widely among practices. Many practices offered no advice about what to do in case of preparation problems. Geographic variations in instructions were also observed.

Conclusion: Despite national recommendations for use of split-dose bowel purgatives, many practices are still relying on single-dose preparations. Clear liquid diets are widely recommended for the day prior to colonoscopy, despite a lack of data to support the need for such a strict dietary regimen. Patients receive disparate instructions regarding the management of their medications. These findings suggest a need for more evidence-based and comprehensive colonoscopy preparation instructions.

Category: Clinical Research

Outcomes of Bisphosphonate Therapy in Kidney Transplant Recipients – a Meta-Analysis of Randomized Controlled Trials

Stephanie M Toth^{1*}, Jean M. Francis² and Craig E. Gordon².

¹Department of Medicine, Boston University School of Medicine, Boston, MA, United States and ²Renal Section, Department of Medicine, Boston University School of Medicine, Boston, MA, United States.

Background: Mineral and bone disorders that precede kidney transplantation are often worsened in the post-transplant setting by immunosuppressive regimens and tertiary hyperparathyroidism. Bone mineral density (BMD) rapidly decreases following transplantation, leading to increased fracture risk. The benefits and risks of bisphosphonates in kidney transplant recipients are not well defined. The aim of this study is to evaluate changes in BMD and fracture rates in bisphosphonate-treated transplant recipients by meta-analysis.

Methods: We performed a systematic review of Cochrane, Embase, and Medline to identify studies that evaluated bisphosphonate therapy in kidney transplant recipients (last searched 4/14/13). Randomized controlled trials comparing bisphosphonate therapy to standard of care in adults were included if follow-up duration was >6 months. We performed a random effects meta-analysis to determine the effect of bisphosphonates on lumbar and femoral neck BMD and fracture incidence.

Results: Of 793 retrieved studies, sixteen met inclusion criteria comprising a total of 748 patients. Mean age was 45.1 years, 69.8% were male, and mean baseline creatinine was 1.5 mg/dL. Treatment with bisphosphonates was associated with improvement in lumbar and femoral neck BMD compared with controls (0.061 g/cm², 95% CI 0.039-0.082 and 0.056 g/cm², 0.020-0.093, respectively). This corresponded to an unweighted improvement in BMD of 7.8% in lumbar spine and 7% in femoral neck. Bisphosphonate therapy had no effect on serum creatinine or calcium. There was no difference in fracture incidence in the two groups.

Conclusions: Bisphosphonate therapy was associated with improved lumbar and femoral neck BMD in kidney transplant recipients without adversely affecting serum creatinine or calcium. Although there was no difference in fracture rates, this may have been due to short follow-up times or the small number of studies reporting clinical outcomes. Future studies should report fracture rates and plan for longer follow-up intervals to better evaluate whether bisphosphonates reduce fracture incidence in kidney transplant recipients.

Category: Quality Improvement Research

Evaluation of duty-hour violations during long-call at the West Roxbury VA

Anjali Verghese M.D., Samantha Sissel

Introduction:

The West Roxbury VA had 5 admitting inpatient general medicine teams. There is a 5-day admitting cycle, the 5th day being “long call” where the team can admit up to 10 patients over a 12 hour period, from 7AM until 7PM. Teams on long call tend to get a “bolus” of admissions later in the afternoon, and the teams often stay late at night finishing admissions, needing to be back by 6:30 AM the following morning for rounds. According to ACGME’s 2011 duty hour rules, interns should not spend more than 16 hours in the hospital, should have 10 hours off in between shifts and must have 8 hours off in between shifts. The goal of this project is to understand why there are duty hour violations during long call.

Methods:

I collected data for all admissions to the West Roxbury VA long call teams during the weekdays between 11/10/2013-11/26/2013 using the CPRS system and VA paging system log data. I mapped out the steps leading to each admission, from first arriving in the emergency room to arriving on the floor. Using this data, I calculated average times each step took: making the decision to admit, assigning a bed, giving sign-out to the team and arriving on the floor. I also used the VA paging system log data to determine when teams signed out their pagers to night float and left for the day.

Results:

Long call teams admitted an average of 8.25 patients during the 12-hour shift. Of these, 48% of patients were admitted through the ED, and the other 52% were inter-hospital transfers, intra-hospital transfers or direct admissions. Overall, patients that arrived in the ED earlier in the day stayed in the ED longer. Patients that arrived in the ED before 1PM, were assigned to a team after 4 hours and 52 minutes. Patients that arrived after 1PM were assigned to a team after 1 hour and 49 minutes. The average time long call admissions from the ED arrived on the floor was 6:45PM. On average, long call teams left at 9:28PM on weekdays, breaking the 10-hour-off rule. Teams left after 10:30PM 33.3% of the time, breaking the 16-hour rule.

Conclusion:

Although the long-call teams admit over a 12-hour period, the average patient arrives on the floor at the 11th hour of the shift. Each admission takes an average of 144 minutes to complete, so if there are more than 2 admissions arriving after 6PM (one for each intern), then the team will likely stay later than 8:30 PM, violating the 10-hour off rule. The next steps in the project will be to determine the specific delays in the system and make targeted suggestions for change.

Category: Clinical Research

Detailed Nutritional Analysis May Help Assess the Impact of Diet on Bowel Preparation

Artur Viana, MD, Arush Singh, MD (co-first author), Pushpak Taunk, MD, Paula Quatromoni, DSc, MS, RD, Audrey H. Calderwood, MD and Brian C. Jacobson, MD, MPH

Background: Bowel preparation instructions often include dietary restrictions in the day(s) preceding a colonoscopy. However, such restrictions vary between endoscopy units and are not always evidence-based. We hypothesized that nutritional analyses could be used to correlate dietary intake of specific nutrients with bowel preparation quality as a foundation for the development of less restrictive dietary instructions.

Methods: Eighty patients underwent a standardized dietary recall interview to capture their dietary intake during the 24 hours preceding an outpatient colonoscopy. Preparation instructions included avoidance of vegetables and beans for 48 hours and a clear liquid diet the day prior to colonoscopy. Data were analyzed using the Nutrition Data System for Research (University of MN), a Windows-based dietary analysis program designed for the collection and analyses of 24-hour dietary recalls and food records. We used Pearson correlation coefficients to measure the association between intake of specific dietary components and both Boston Bowel Preparation Scale (BBPS) and Boston Classification of Excrement and Residue (B-CLEAR) scores. Higher BBPS and lower B-CLEAR scores indicate cleaner colons. Calculations were performed using SAS 9.1 (Cary, NC).

Results: The median age of the patients was 55 (interquartile range 50-63), 53% were male, 32% were white, 44% were black, 4% were Asian and the rest self-identified as “other” race. For ethnicity, 32% were Hispanic. Nearly all (98%) reported drinking at least $\frac{3}{4}$ of the bowel purgative and 90% said they understood the preparation instructions. At colonoscopy, only 53% of patients reported adherence to the strict clear liquid diet. Table 1 demonstrates the dietary components that were significantly correlated with bowel preparation quality including water and vegetable protein (B-CLEAR only), and fiber, starch, and total and refined (but not whole) grains (B-CLEAR and BBPS). Fat intake was associated with BBPS and B-CLEAR segment scores in the right colon only ($r=-0.23$, $p=0.04$ and $r=0.22$, $p=0.05$ respectively). Total caloric intake, total and animal protein, carbohydrates, and pectins did not correlate with bowel preparation quality. Too few patients consumed dairy, nuts or legumes to assess these dietary factors.

Conclusion: Despite the provision of standardized, restrictive dietary instructions to patients, detailed nutritional analyses still provided information about specific dietary components and their association with bowel preparation quality. Such an approach might be useful for developing less-restrictive dietary instructions while preserving adequacy of bowel cleanliness at colonoscopy. Our findings further validate the B-CLEAR as a novel research tool that may be superior to the BBPS as an instrument for research assessing the impact of diet on bowel preparation.

Table 1. The association between dietary components and bowel cleanliness

	Total BBPS Scores		B-CLEAR Scores	
	Correlation Coefficient (r)	P-value	Correlation Coefficient (r)	P-value
Water (grams)	0.14	0.23	-0.32	<0.004
Total dietary fiber (grams)	-0.27	<0.02	0.20	<0.08
Insoluble fiber (grams)	-0.32	<0.004	0.23	<0.04
Vegetable protein (grams)	-0.11	0.35	0.22	0.05
Starch (grams)	-0.32	<0.005	0.28	<0.02
Total grains (ounce equivalents)	-0.24	0.04	0.28	<0.02
Refined grains (ounce equivalents)	-0.27	0.01	0.30	<0.008

Effect of ACE-inhibitor or ARB on the progression of acute kidney injury in hospitalized heart failure patients

Author: Ke Wang, M.D.

Co-investigators: Mayank Sardana, Payel Roy, Bailey Chang, Youssef Rahban

Faculty mentor: Ashish Upadhyay

Introduction:

Angiotensin-converting-enzyme inhibitor (ACE-I) and angiotensin-receptor blockers (ARB) improve survival and heart failure symptoms in patients with congestive heart failure. However, ACE-I and ARB may lower glomerular filtration rate by decreasing intra-glomerular pressure. Since Acute Kidney Injury (AKI) has been shown to be a powerful predictor for adverse outcomes in heart failure patients, we examined if early discontinuation of ACE-I or ARB after in-hospital AKI in patients with heart failure affects AKI progression.

Methods:

We extracted 4663 clinical charts from the BMC Heart Failure Database from 2/2007 to 6/2013. Specific ICD-9 codes involving AKI were used to query all charts, yielding 2431 admissions with likely in-hospital AKI. 1366 unique pts were identified and charts were reviewed by 5 reviewers. Inclusion criteria are as follows: patients with normal renal function or baseline renal function on admission who developed AKI after admission and were taking ACE-I or ARB at the time of AKI development. Whether ACE-I or ARB was discontinued after AKI was verified and the exact timing of discontinuation documented. We examined whether discontinuation of ACE-I or ARB within a calendar day or 24 hours after the AKI diagnosis affected the primary outcome of doubling of serum Cr. Secondary outcomes were the absolute change in serum Cr, length of hospital stay and onset of peak Cr.

Results:

Of 1366 charts reviewed, 202 met inclusion criteria. Group 1 includes 27 patients with discontinuation of ACE-I or ARB within 24 hours after AKI, group 2 includes 36 patients with discontinuation of ACE-I or ARB beyond 24 hours after AKI and group 3 includes 139 patients whose ACE-I or ARB was continued through hospitalization. Our primary analysis examined the effect of early discontinuation of ACE-I or ARB and compared group 1 vs. groups 2 + group 3. There was no statistical difference in the primary outcome of doubling of serum Cr between the two groups (25.9% vs 22.8%, $p=0.91$). There was also no statistical difference in the secondary outcomes of absolute change in serum Cr (0.99 mg/dL vs 0.80 mg/dL, $p=0.07$), length of hospital stay (10.3 days vs. 8.7 days, $p=0.31$) and onset of peak Cr (3.06 days vs. 2.38 days, $p=0.33$).

Since our primary analysis did not demonstrate any difference in outcomes, we proceeded to perform a secondary analysis examining the effect of early discontinuation of ACE-I or ARB only in patients whose ACE-I or ARB was discontinued after AKI (group 1 vs. group 2). Compared to group 1, group 2 had higher rates of Cr doubling that was statistically significant (58.0% vs. 25.9%, $p=0.021$). Group 2 also had greater absolute change in Cr compared to group 1 that was statistically significant (1.36 mg/dL vs. 0.99 mg/dL, $p=0.024$, 95% CI 0.05 to 0.68). There was no statistical difference between the two groups with regards to length of hospital stay (12.1 days vs. 10.3 days, $p=0.3$) or onset of peak Cr (4.08 days vs. 3.06 days, $p=0.28$).

Conclusion:

Preliminary results from our primary analysis suggest that early discontinuation of ACE-I or ARB after AKI does not affect AKI progression in heart failure patients since there was no difference in outcomes between patients whose ACE-I or ARB was discontinued early compared to the rest of the study population. Perhaps the improved renal autoregulation seen with ACE-I or ARB discontinuation is negated by the worsened hemodynamics caused by the withdrawal of these agents. Interestingly, our subgroup analysis suggests a trend towards improved kidney outcomes in patients whose ACE-I or ARB was discontinued early compared to late. We currently cannot make definitive conclusions regarding this finding. We plan to perform multiple regression in order to adjust for potential confounders. We are also currently in the process of collecting more data.

Category: Clinical Research

Risk Factors for Non-Adherence with Routine Screening Mammography in HIV-Infected Women

Zoe Weinstein M.D., Amy Baranoski M.D. Msc

OBJECTIVE: With advances in antiretroviral treatment over the past two decades, life expectancy has increased significantly for HIV-infected individuals; making it more important than ever to ensure the aging HIV-infected population is obtaining routine cancer screening for non-AIDS-defining malignancies. Screening mammography is especially critical, as breast cancer is the most common malignancy diagnosis for American women. The objective of this study was to identify risk factors for inadequate screening mammography in a diverse cohort of HIV-infected women at a large urban safety-net HIV clinic.

METHODS: This retrospective cohort study reviewed the electronic medical record of HIV-infected women aged 40 and older receiving HIV care between October 1st, 2003 and March 31, 2008, for risk factors associated with inadequate screening mammography, defined as not having a mammogram within two years of first HIV clinic visit during the study period. Analyses included Chi square testing and unadjusted and multivariate adjusted logistic regression.

RESULTS: 146 of 292 (50%) of women had a mammogram within two years of initial HIV clinic visit. In unadjusted analysis, women who were of white race, U.S. born, English-speaking, unemployed, high school or higher education level, or who had an HIV viral load >75 copies/mL or a CD4 T-cell count <200 cells/mm³ had increased odds of not undergoing a mammogram. In multivariate analysis, women who were U.S. born (OR 2.7 CI [1.5-4.6]), completed high school or higher education (OR 1.8 [CI 1.1-3.0]) or had an HIV viral load >75 copies/mL (OR 2.2 CI [1.3-3.9]) had increased odds of not obtaining a mammogram.

CONCLUSIONS: Only half of HIV-infected women aged 40 and older had a mammogram within 2 years of initial HIV clinic visit in this study. U.S. born status, higher education level and detectable HIV viral load were associated with inadequate screening mammography. This study demonstrates an unacceptably low proportion of HIV-infected women undergoing routine screening mammography in a socioeconomically disadvantaged patient population, and further study is needed to identify interventions to improve screening mammography rates in this vulnerable population.

Category: Clinical Research

Low testing rates for disorders to exclude in the diagnosis of Polycystic Ovarian Syndrome

Devina L. Willard, MD; Melanie M. Mott, MS, RD; Nicole R. Kitos, MA, MSPH; Andrea D. Coviello, MD, MSE
Section of Preventive Medicine & Epidemiology and Section of Endocrinology, Diabetes, & Nutrition, Department of Medicine, Boston University School of Medicine

Background: Polycystic Ovary Syndrome (PCOS) is the most common endocrine disorder in premenopausal women. The diagnosis of PCOS is based on the presence of 2 of 3 conditions: clinical or biochemical hyperandrogenism, oligomenorrhea, and polycystic ovaries. The *Endocrine Society's PCOS Clinical Practice Guideline* requires the exclusion of disorders with similar presentations in the diagnosis of PCOS including thyroid disease, hyperprolactinemia/pituitary disease, late-onset congenital adrenal hyperplasia (CAH), as well as less common conditions such as hyper/hypo-gonadotropic ovarian failure and androgen-secreting tumors.

Objective: To determine testing rates for disorders to exclude in the diagnosis of PCOS.

Methods: Women ages 18-50 years with newly-diagnosed PCOS (n=716) were identified in the electronic medical record (EMR) at Boston Medical Center from 2006-2011. Race-ethnicity (RE) was self-reported (Black, Hispanic, White, or Other). Oligomenorrhea, irregular menses, amenorrhea, infertility, hirsutism, and acne phenotypes were determined from the problem list. The presence of recommended blood tests including testosterone, DHEAS, LH, FSH, TSH, prolactin, 17-hydroxyprogesterone (17OHP) as well as pelvic ultrasound were determined from the EMR. Group comparisons were by ANOVA and Chi²/FE, alpha=0.05 (SASv9.1).

Results: Mean age at PCOS diagnosis was 27±7 years. Among women with newly-diagnosed PCOS, 32% were Black, 15% were Hispanic, 28% were White, and 24% were of Other REs. Reproductive disorders were more prevalent than hyperandrogenic disorders. Most PCOS phenotypes were more common in Black women than all other REs (p<0.05). Testosterone (40%) and DHEAS (30%) were obtained more frequently than pelvic ultrasound (17%). TSH was the most commonly obtained test (63%). Less than half the cases were screened for other disorders: 30-37% had gonadotropins (ovarian failure), 35% had prolactin (hyperprolactinemia/pituitary disease) and 11% had 17OHP (CAH). Screening rates in Black, Hispanic, or Caucasian patients were higher than in Other REs (p<0.05).

Summary: Less than half of women with newly-diagnosed PCOS were screened for related disorders. Thyroid disease was the most commonly excluded disorder.

Conclusion: Appropriate clinical evaluation in women being evaluated for PCOS was low. Greater awareness of the medical conditions to exclude when diagnosing PCOS may facilitate appropriate diagnosis and treatment of these disorders in affected women.

Category: Quality Improvement Research

A Human Factors Redesign to Improve the Efficiency of an Electronic Order Menu

David Yuh, Eben Lichtman, Silpa Poola Kella, Katherine Thompson, Jessica Gereige, Shazia Ahmad, Samantha Sissel, David Thornton, Anand Kartha

Background:

Human Factors Engineering, or ergonomics, is defined as “an applied science concerned with the characteristics of people that need to be considered in designing things that they use in order that people and things will interact most effectively and safely.”¹ Medicine Residents rotate through the VA Boston from three residency programs which each use their own electronic health records (EHR), all different from the VA’s “Computerized Patient Record System” (CPRS). The “Medical Service” electronic order menu in CPRS was perceived to be unintuitive and difficult to navigate, making commonly and/or important orders difficult to find.

Methods:

The electronic medical order menu was redesigned utilizing Human Factors concepts (e.g. “minimizing information access cost”²) along with real time feedback from frontline staff and engineers. Using a 5S methodology, clinicians were timed in finding 9 items, pre- and post-redesign, to measure changes in efficiency. The redesigned menu was gradually implemented for use via Plan-Do-Study-Act cycles until the newly designed menu was fully implemented. Surveys were conducted to determine frontline staff satisfaction at the end of the project.

Results:

The “Medical Service” order menu was replaced with a version redesigned ergonomically. 17 frontline staff took an average of 3 minutes 53 seconds to locate nine orders using the original order menu. After redesign, it took 17 frontline staff an average of 1 minute 53 seconds, a 44% reduction. 82% of frontline staff surveyed reported orders were easier to find and 64% perceived greater efficiency with use of the new menu. 100% of frontline staff surveyed were “in favor” of the new order menu.

Conclusions:

A human factors redesign improved the efficiency of electronic order menu. The time utilized by frontline staff to locate 9 specific items decreased by almost half (44%). The majority of front line staff were surveyed believed the new menu to be easier use and more efficient. 100% of frontline staff surveyed were “in favor” of the new order menu. Further improvements could be made by deleting unnecessary items from the newly redesigned menu.

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