Internal Medicine Residency Program
Boston University Medical Center

Senior Resident Academic Day

May 15, 2026

Handbook of Abstracts

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Oral Abstracts

Category: Oral abstract

The Diabetes Remission Index (DRI): An Innovative Predictive Model For Diabetes Remission After Bariatric and Metabolic Procedures

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Introduction: Type 2 diabetes (T2D) represents a significant public health burden, with metabolic and bariatric surgeries (MBS), such as Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG), offering effective treatment options. While these procedures are associated with high rates of diabetes remission, outcomes remain variable. This study aimed to develop two novel prognostic models, the Diabetes Remission Index (DRI) and the Weight Loss-Adjusted Diabetes Remission Index (W-DRI), to predict T2D remission after MBS.

Methods: This multicenter, retrospective cohort study evaluated patients with T2D and obesity who underwent RYGB or SG between 2008 and 2018. Inclusion criteria required a diagnosis of T2D and complete follow-up data, while patients with conditions affecting weight or glucose metabolism were excluded. The DRI model was developed using preoperative variables, while the W-DRI incorporated postoperative weight loss. Predictive accuracy was assessed using the area under the receiver operating characteristic curve (AUC), calibration plots, and stratified analysis.

Results: The study included 503 patients from Institution 1 (I-1) and 409 from Institution 2 (I-2). The DRI model incorporated preoperative variables, including T2D duration, HbA1c, insulin use, number of diabetes medications, and presence of vascular complications. The W-DRI further integrated postoperative weight loss as a variable. In I-1, 44.7% of patients achieved T2D remission, with a DRI AUC of 0.80 (95% CI: 0.77–0.83). External validation in I-2 demonstrated remission in 52.6% of patients and a comparable AUC of 0.78 (95% CI: 0.75–0.81). Incorporating weight loss into the W-DRI improved predictive performance, with AUCs of 0.82 (95% CI: 0.79–0.85) in I-1 and 0.79 (95% CI: 0.76–0.82) in I-2. Patients achieving ≥25% total body weight loss had significantly higher remission rates. Calibration analysis showed strong alignment between predicted and observed remission rates. An interactive DRI and W-DRI calculator is now available on the Mayo Clinic webpage (Mayo Clinic: Diabetes Remission Index).

Conclusion: This study developed and validated the DRI and W-DRI models, which demonstrated robust predictive accuracy for T2D remission after MBS. These models provide valuable tools for tailoring patient care and optimizing treatment outcomes. Future studies should expand these models to diverse populations and explore additional predictive variables.

Category: Oral abstract

Association of Lipoprotein (a) with Atrial Fibrillation in the Framingham Heart Study

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Background: Identifying risk factors for atrial fibrillation (AF) is crucial for its prevention and management. While association between lipoprotein (a) (Lp(a)) and atherosclerotic cardiovascular disease and calcific aortic valve stenosis are established, existing evidence on Lp(a)'s relationship with AF remains mixed. Using Framingham Heart Study (FHS), we examined the relationship between Lp(a) and AF, hypothesizing that elevated Lp(a) levels are associated with increased risk of incident AF.

Methods: We examined AF-free FHS Offspring and Omni 1 participants aged ≥45 years who attended an exam visit with Lp(a) measurements (1998-2001). Lp(a) was analyzed as 1) elevated (>50 mg/dL) versus normal (≤50 mg/dL), and as 2) a standardized continuous variable (per 1 SD of ln-transformed Lp(a)). We examined Fine-Gray subdistribution hazard ratios (sHR), accounting for the competing risk of mortality, for the association between Lp(a) and incident AF, adjusting for established AF risk factors. We also assessed for effect modification by age group (≥65 vs <65 years old) and sex (female vs male).

Results: We studied 3,378 participants (mean age 61± 9 years, 56% women), of whom 15% had elevated Lp(a) (>50 mg/dL). During an average of 17.0±6.6 years of follow up, 692 participants were diagnosed with AF (12.1 per 1,000 person-years). Participants with elevated Lp(a) had 20% higher incidence of AF as compared to those with normal Lp(a) (sHR: 1.20 [95% CI: 0.98-1.47], p=0.07), which was not statistically significant. Continuous Lp(a) was not associated with AF incidence (sHR [per 1 SD=30 mg/dL]: 1.03 (0.96, 1.11), p=0.41). There was no evidence of effect modification by either age group (*P* value for interaction =0.41) or sex (*P* value for interaction =0.93).

Conclusion: Our study did not find a statistically significant association between Lp(a) and incident AF in a community-based sample of individuals without AF at baseline. While we did not confirm a link, we provide further data about the potential magnitude of association from null to a very modest 1.2-fold association. Further research is needed to reconcile conflicting findings and determine the robustness of the association.

Category: Oral Abstract

Human B cell populations that drive allergic asthma

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Background: Allergic asthma is a chronic inflammatory airway disease characterized by bronchial hyperresponsiveness, reversible airflow obstruction, and mucus overproduction, driven predominantly by type 2 (T2) immune responses to environmental allergens. However, not all individuals with allergies go on to develop asthma. We sought to distinguish the key airway immune signatures that distinguish allergic asthma from allergy alone. Specifically, we compared airway mucosal B cell transcriptional signatures between allergic asthmatics (AA) and allergic non-asthmatic controls (AC) at baseline and after allergen challenge using segmental allergen challenge (SAC), a human model of asthma exacerbation.

Methods: Human participants with allergic asthma (n=4) and allergy alone (n=4) underwent bronchoscopic SAC. Airway samples were collected at baseline and 24 hours after administration of allergen or diluent control, including bronchoalveolar lavage (BAL) fluid and endobronchial brushings. Single-cell suspensions were generated and analyzed using single-cell RNA sequencing (scRNA-seq) to profile airway immune cell populations at high resolution.

Bioinformatic analyses were performed to identify distinct cell clusters, transcriptional programs, and define differential responses to allergen exposure between asthmatic and allergic control subjects. Differential expression analysis was performed using a pseudobulk approach, supplemented by Wilcoxon rank-sum testing at the single-cell level. Cytokine profiling was used to further characterize immune phenotypes.

Results: Through iterative cell clustering and differential gene expression analyses, 9 B cell subpopulations were identified and characterized from endobronchial brushings. AA were enriched for FCRL4^{+}/CD11c^{+} atypical memory B cells at baseline, compared to AC. After SAC, AA were enriched for B cells with a type 2-skewed immune profile, with upregulation of *FCER2* and *IL4R*. BAL protein levels of immune mediators involved in B cell chemotaxis, tissue residence, and differentiation including CXCL12 and CXCL13 were elevated in AA compared to AC after SAC.

Conclusion: B cells are central to humoral immunity through IgE production and antigen presentation, however their dynamic activation states in the airways of human patients with allergic asthma have not yet been well characterized. We found FCRL4^{+}/CD11c^{+} atypical memory B cells enriched at baseline in allergic asthmatic airways, which may represent a tissue-resident antigen-experienced B cell population unique to allergic asthma. Additionally, a T2-skewed B cell population was preferentially enriched in AA after SAC, suggesting that in asthmatic airways, allergen exposure actively polarizes B cells toward a humoral response capable of sustaining and amplifying T2 inflammation. Together, these findings identify airway mucosal B cell heterogeneity as a

distinguishing immunological feature of allergic asthmatic airways and highlight atypical memory B cells and T2-skewed humoral responses as potential contributors to disease pathogenesis and future therapeutic targets.

Category: Oral abstract

Metabolic Modulation and Atrial Fibrillation: Glucagon-Like Peptide-1–Based Therapy and Risk of Incident Atrial Fibrillation in Non-Diabetic Adults with Obesity

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Introduction: Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia and is strongly associated with obesity. Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) improve weight and cardiometabolic profiles; however, their impact on arrhythmia risk remains incompletely defined, particularly in non-diabetic populations. We aimed to evaluate the association between GLP-1–based therapies and incident atrial fibrillation in non-diabetic adults with obesity using real-world data.

Methods: We conducted a retrospective cohort study using the TriNetX Global Collaborative Network, encompassing 171 healthcare organizations. Adults ≥18 years with obesity (BMI ≥30 kg/m²) were included if indexed between January 1, 2023, and January 1, 2025. Patients with prior atrial fibrillation or flutter, prior GLP-1 RA exposure, or a diagnosis of diabetes mellitus were excluded. The exposure group comprised patients initiated on GLP-1–based therapies (semaglutide, liraglutide, dulaglutide, or tirzepatide), while the comparator group had no history of GLP-1 RA exposure. Propensity score matching (1:1 greedy nearest-neighbor, caliper 0.1 SD) was performed to balance baseline characteristics. The primary outcome was incident AF. Risk ratios (RR) and hazard ratios (HR) with 95% confidence intervals (CIs) were calculated.

Results: After propensity score matching, 113,471 patients were included in each cohort. Mean age was approximately 50 years, with approximately 71% female patients. Over a median follow-up of 369 days in the GLP-1 RA group and 471 days in the control group, incident AF occurred in 737 patients (0.7%) versus 1,446 patients (1.3%), respectively. GLP-1 RA use was associated with a significantly lower risk of incident AF (RR 0.51, 95% CI 0.47–0.56; absolute risk difference − 0.6%; $p<0.001$). Kaplan-Meier analysis demonstrated early and sustained separation of event-free survival curves. Cox proportional hazards modeling confirmed a 39% relative reduction in AF risk (HR 0.61, 95% CI 0.55–0.66; log-rank $p<0.001$).

Conclusions: In this large real-world cohort of non-diabetic adults with obesity, GLP-1–based therapy was associated with a significantly reduced risk of incident atrial fibrillation. These findings suggest a potential role for GLP-1 RAs in arrhythmia risk modification beyond their established metabolic benefits. Prospective studies are warranted to confirm causality and elucidate the underlying mechanisms.

Category: Oral abstract

Outcomes in *TTR* p.V142I Carriers with Non-amyloid Heart Failure: The SCAN-MP Study

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Introduction: The most common inherited cause of transthyretin amyloid cardiomyopathy (ATTR-CM) is the p.V142I transthyretin (*TTR*) variant, which is prevalent in Black Americans but has incomplete penetrance. Population studies of p.V142I carriers demonstrate elevated cardiovascular risk, but data are limited by lack of diagnostic testing to identify ATTR-CM. Furthermore, surveillance testing of carriers with radionuclide scintigraphy has imperfect sensitivity leading to under-recognition of early ATTR-CM.

Hypothesis: Among older adults with non-amyloid heart failure determined by scintigraphy, p.V142I carriers will have worse clinical outcomes than *TTR* wild-type controls.

Methods: The Screening for Cardiac Amyloidosis with Nuclear scintigraphy in Minority Populations (SCAN-MP) study screened 650 older (age ≥60 years) Black or Caribbean Hispanic adults with heart failure for ATTR-CM. Among 604 participants who tested negative for ATTR-CM by Tc99m pyrophosphate scintigraphy, p.V142I carriers (n = 16) were compared to genetically normal controls, propensity matched for age, sex, race, and New York Heart Association class in a 1:4 ratio. Cox models compared time to first composite all-cause hospitalization or death, first cardiovascular hospitalization, first heart failure hospitalization, and all-cause death.

Results: Per study design, p.V142I carriers and controls had similar age and equivalent NYHA class, sex, and race distribution (Table 1). There were no differences in baseline biomarkers (except prealbumin which was lower in p.V142I carriers), comorbidities, or echocardiographic parameters (Table 1). Over a median follow-up of 364 days, p.V142I carriers were more likely to be hospitalized or die from any cause (HR 2.7 [1.2, 6.5], p = 0.02) and to be hospitalized for cardiovascular causes (HR 3.45 [1.1, 10.9], p = 0.04) [Figure 1] p.V142I carriers had numerically higher rates of heart failure hospitalization (HR 3.5 [0.8, 15.7], p = 0.10) that did not reach significance owing to few events.

Conclusions: Compared to matched controls, *TTR* p.V142I carriers with heart failure but no evidence of ATTR-CM by radionuclide scintigraphy had an increased risk of adverse cardiovascular outcomes, suggesting possible subclinical ATTR-CM. p.V142I carriers, especially those with heart failure, may benefit from more sensitive methods to diagnose early ATTR-CM that supports prompt initiation of disease modifying therapy.

Category: Oral abstract

Clinical Outcomes of Real-World Avacopan Use in ANCA-associated Vasculitis: A Multicenter, Retrospective Comparative Study.

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Background/Aims: Antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis (AAV) is a systemic autoimmune disease with high morbidity and mortality, partly due to treatment-related toxicities from glucocorticoids (GCs). Avacopan, an oral C5a receptor (C5aR1) inhibitor, demonstrated efficacy and GC-sparing effects in the ADVOCATE trial, leading to FDA approval in 2021. Data describing real-world avacopan use outside of clinical trials are limited. We aim to evaluate clinical outcomes and GC-sparing effects of avacopan in patients with AAV treated in routine practice across Mayo Clinic sites.

Methods: We conducted a retrospective, multicenter cohort study of adults diagnosed with granulomatosis with polyangiitis (GPA) or microscopic polyangiitis (MPA) per 2022 EULAR/ACR criteria who received avacopan during induction therapy at Mayo Clinic (Minnesota, Arizona, Florida and Wisconsin) between October 1, 2021, and June 31, 2024 and comparators that received remission induction before avacopan got FDA approval (October 2021). Patients required ≥12 months of follow-up. Outcomes included prednisone doses, remission (BVAS=0) and complete remission (BVAS=0 and no prednisone).

Results: A total of 124 patients with AAV were included, comprising 64 patients treated with avacopan and 60 receiving standard therapy. Baseline demographic characteristics were broadly similar between cohorts. Mean age was 58.1 years (SD 18.4) in the avacopan group and 54.9 years (SD 18.7) in the standard therapy group, with female sex represented in 56.3% and 60.0%, respectively. GPA was the most common phenotype in both groups (64.1% vs 76.7%), while PR3-ANCA positivity predominated (51.6% vs 56.7%). Initial prednisone doses were comparable between groups (median 60 mg [IQR 40–60] in both cohorts). However, prednisone tapering was more rapid among patients receiving avacopan, with lower median prednisone doses observed at week 4 (25 mg [IQR 10–40] vs 40 mg [30–52.5]), week 12 (7.5 mg [0–15] vs 20 mg [10–25]), and week 26 (0 mg [0–5] vs 5 mg [0–10]). By week 52, median prednisone dose was 0 mg in both groups. Clinical remission was achieved in 93.8% of patients treated with avacopan and 100% of those receiving standard therapy. Complete remission occurred in 70.3% of the avacopan cohort compared with 60.0% of the standard therapy cohort.

Conclusion: In this multicenter real-world cohort of patients with AAV, avacopan was associated with substantially faster glucocorticoid tapering and lower prednisone exposure over the first year of treatment, while maintaining high rates of remission comparable to standard therapy. Complete remission was numerically more frequent among patients receiving avacopan. These findings support avacopan as an effective steroid-sparing adjunct during induction therapy and reinforce its emerging role in the management of AAV.

Category: Oral abstract

Racial and ethnic representation in allergic rhinitis randomized trials: a comparison within the US disease population

Amos Wu, Wissam Ghusn, Frederic F. Little

Background: Representative study populations are necessary to ensure external validity of clinical trials. Study conclusions are most applicable to diverse real-world patient populations that are also well-represented within the study population. It is unclear whether randomized controlled trials in allergic rhinitis utilize study populations that approximate the demographic characteristics of those who suffer from allergic rhinitis in the United States.

Objective: To determine if study populations recruited for clinical trials in allergic rhinitis in the last thirty years are representative of the population within the United States that suffers from the disease.

Methods: A review of randomized clinical trials on Clinicaltrials.gov was performed using the search term "allergic rhinitis." Demographic data including age, sex, race, and ethnicity was extracted. This data was compared to demographic data from the 2005-6 National Health and Nutrition Examination Survey (NHANES), which was used to approximate the characteristics of the patient population within the United States that suffers from allergic rhinitis.

Results: The proportion of male and female participants in trials was not significantly different from the proportion of males and females within the population in the US that suffers from allergic rhinitis (P = 0.97). The proportion of white participants in RCTs was significantly higher than the proportion of white patients in the US (78.3% vs 60.1%, P=0.00055 [49.8%-70.4%]). The proportion of black participants was significantly lower than the proportion of black patients (11.2% vs 22.8%, P = 0.01 [14.0%-31.4%]). The proportion of Hispanic trial participants did not differ significantly from the proportion of people with allergic rhinitis in the US who were Hispanic (16.5% vs 12.9%, P = 0.46 [3.08%-22.6%])

Conclusion: Black individuals are underrepresented among clinical trials in allergic rhinitis. There is insufficient data to draw conclusions regarding adequacy of representation of other minority groups including Asians, Native Hawaiians, Pacific Islanders, American Indians, and those of multiple races. Demographics of participants in randomized clinical trials in allergic rhinitis were largely comparable to the population in the United States that suffers from it in terms of age and sex. Intentional recruitment of diverse study populations should be pursued so that conclusions of randomized clinical trials may be applied more broadly to those who suffer from allergic rhinitis.

Poster Presentations

Category: Clinical research

Mexiletine-Based Combination Antiarrhythmic Therapy for the Suppression of Frequent Ventricular Premature Complexes: A Meta-Analysis with Pre-Specified Stratified Analysis.

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Background: Mexiletine, a Class IB sodium channel blocker, when used in combination with Class IA agents, beta-blockers, or amiodarone may achieve dose-sparing antiarrhythmic synergy in patients with frequent or refractory PVCs. However, pooled efficacy and tolerability have not been systematically quantified.

Objective: To (1) quantify additive PVC suppression with mexiletine combination therapy, (2) compare mexiletine monotherapy with alternative antiarrhythmics, and (3) evaluate dose reduction and tolerability.

Methods: A systematic review and meta-analysis were conducted per PRISMA 2020 guidelines. MEDLINE, EMBASE, CENTRAL, and Web of Science were searched without restrictions. Studies were stratified by design (crossover vs. sequential/refractory). Random-effects meta-analysis (DerSimonian-Laird) estimated mean and proportion differences. Heterogeneity was assessed using I^2; sensitivity analyses included leave-one-out and meta-regression.

Results: Across 10 studies (n=153) combination therapy significantly reduced PVC burden across all monotherapy arms. Primary analysis achieved effective PVC suppression in 24.9% ($p = 0.016$) in stratum A and 55.1% ($p = 0.009$) in Stratum B compared to best monotherapy. Similarly, subgroup analysis demonstrates that mexiletine add-on therapy increased effective PVC suppression by 26.9% (p: 0.006) in stratum A and 39.2% (p: 0.049) in stratum B compared to comparator monotherapy. Insufficient statistical significance for mexiletine monotherapy versus comparators (−0.4%, $p=0.944$). Dose-response and responder concordance supported combination therapy.

Conclusions: Mexiletine-based combination therapy provides significant incremental PVC suppression with favorable tolerability. Combination regimens reported fewer adverse events and no serious proarrhythmic events.

Category: Clinical research

Association Between Absolute Eosinophil Count and Outcomes in Sickle Cell Disease Vaso-Occlusive Episodes

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Objective: Patients with sickle cell disease (SCD) may experience vaso-occlusive episodes (VOE) requiring hospitalization. Studies have shown that treatment with hydroxyurea reduces both eosinophil degranulation and VOE frequency among those with SCD. Since eosinophil activation appears to reflect disease at the molecular level, we sought to evaluate whether absolute eosinophil count (AEC) could predict SCD severity in the clinical setting.

Methods: We performed a multicenter retrospective cohort study using the Premier Healthcare Database (2022-2024). Eligible patients had a SCD VOE diagnosis code and at least 1 AEC on the day of admission. Patients were classified according to Angus-defined organ dysfunction algorithms and Gagne's combined comorbidity scores; the primary outcome was length of stay (LOS).

Results: Among 3078 patients included, median AEC on admission was 200 (interquartile range [IQR]: 90-400) cells/μL and overall median hospital length of stay (LOS) was 4 (IQR 3-7) days. There was no correlation between AEC and hospital length of stay (Spearman's Rho -0.007; p=0.70) and no association between AEC and hospital length of stay in the unadjusted (beta 0.0 [95% CI 0.0-0.0] per 1000 cells/μL; p=0.65) or adjusted (beta -0.1 [-0.4-0.2] per 1000 cells/μL; p=0.49) median regression models. There were no associations between AEC and hospital mortality (13 deaths; adjusted odds ratio: 1.00 [95% CI 0.995-1.001] per 1000 cells/μL; p=0.36) or between AEC and the composite of acute chest syndrome, venous thromboembolism, or ischemic stroke (32 events; adjusted odds ratio 1.03 [95% CI 0.32, 2.33]).

Conclusion: Although AEC may reflect SCD at the molecular level, these findings do not translate to statistically significant associations between AEC and LOS in the clinical setting.

Category: Clinical research

Epidemiology of sleep quality and pain sensitivity in a community-based cohort of older adults

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Background: Poor sleep is a common, modifiable risk factor for chronic pain, yet how the sleep-pain relationship evolves across the lifespan remains unclear. In healthy young adults, experimental sleep restriction produces hyperalgesia, with the magnitude of effect decreasing across an age range capped at midlife. Using a sample unselected for pain conditions, we assessed whether this negative relationship of sleep quality to pain sensitivity extrapolates to middle-aged and older adults.

Methods: Participants were 1,213 community-dwelling adults from an ancillary study of the Framingham Heart Study/Omni1 (mean age 75 ± 7; range 52-102; 55% female). Participants rated their sleep quality in the prior 7 days from 1 (very poor) to 5 (very good) and underwent two forms of quantitative sensory testing (QST) to assess pain sensitivity: pressure pain threshold (PPT) and conditioned pain modulation (CPM). PPT (kg/cm^2) was obtained by applying an algometer to the right trapezius at increasing pressure until the participant reported slight pain (average of 3 trials); higher PPT indicated lower pain sensitivity. CPM was calculated as the ratio of PPT before and after inflation of a blood pressure cuff as a painful conditioning stimulus; increased post-inflation PPT indicates efficient descending pain modulation. We modeled the relation of sleep quality to PPT and CPM in separate linear regressions adjusted for sex, BMI, and depression. Analyses were also stratified by age above (77+ years) or below (52-76 years) the median.

Results: In the unadjusted models, each 1-unit increase in sleep quality corresponded to a 0.10 kg/m^2 increase in PPT (p=0.02). The relation of sleep quality to CPM was non-significant (β=0.09, p=0.10). Age-stratified models did not yield statistically significant associations, but effect estimates were numerically stronger in the older stratum (77+ years: PPT β=0.12; CPM β=0.12) than in the younger stratum (52-76 years: PPT β=0.08; CPM β=0.06).

Conclusions: In this community-based cohort spanning midlife to advanced age, better self-reported sleep quality was modestly associated with reduced pressure pain sensitivity, showing that this well-established relationship in younger adults persists into late adulthood. Although the oldest adults showed the numerically strongest sleep-pain association, in contrast to the decrease previously seen from young adulthood to middle age, our age-stratified results were not significant and differences between age groups were small. These results support sleep quality optimization as part of the toolkit for managing chronic pain in older adults, as well as inclusion of older adults in future mechanistic and interventional studies on the sleep-pain relationship.

Category: Clinical research

Variability of Medication Use in Systemic Sclerosis-related Pulmonary Hypertension with and without Prior Pulmonary Embolism

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Rationale: Chronic thromboembolic pulmonary hypertension (CTEPH) has been poorly described in systemic sclerosis (SSc) in which there is an increased risk of venous thromboembolism. The goal of this study was to investigate clinical characteristics and variability of medication use in patients who have SSc-related pulmonary hypertension (SScPH) with and without a prior pulmonary embolism (PE).

Methods: Using the TriNetX database and Common Procedural Terminology (CPT) and International Classification of Diseases-10 (ICD) codes, we identified adult patients with SSc (ICD M34) who were diagnosed with PH (I27.2) following right heart catheterization (RHC) or combined left/right catheterization (CPT 93453/93541, respectively). Patients who had a preexisting PH diagnosis at or prior to the time of SSc diagnosis were excluded. We set time of catheterization as the index event and investigated the use of vasodilators, diuretics, and anticoagulation in each group represented by RxNorm inputs.

Results: Out of 536 SSc patients without a preexisting PH diagnosis, 83 (15.5%) had a history of PE and 453 (84.5%) did not. Most patients were female in both groups, and mean ages were similar (Table 1). Out of the 419 SSc patients who developed PH following the index event, 70 (84.3%) had a history of PE and 349 (77.0%) did not (risk difference 7.3%, $p<0.05$). There were no significant differences in overall prescriptions of all vasodilators or loop diuretics between the two groups, $X 2 (1, N = 419, p>0.05) = 0.55$ and $X2 (1, N = 419, p>0.05) = 3.28$ respectively. There were statistically significant differences in prescriptions of apixaban and warfarin between the two groups, $X2 (1, N=419, p<0.05) = 22.89$ and $X2 (1, N = 419, p<0.05) = 4.47$ respectively.

Conclusions: SSc patients with a history of PE have a greater risk difference for PH compared to those without a history of PE with significant differences in oral anticoagulation usage, although without significant differences in vasodilator usage.

Category: Education /Quality Improvement

Can Shifting the Task of MASLD Risk-Stratification from PCPs to Ambulatory Care Pharmacists Improve Detection of MASLD-Related Significant Fibrosis in Primary Care Patients with Type 2 Diabetes Mellitus?

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Background: Metabolic dysfunction-associated steatotic liver disease (MASLD) and related significant hepatic fibrosis are common in patients with type 2 diabetes mellitus (T2DM) but remain underdiagnosed despite guideline recommendations due to knowledge gaps, competing priorities, and inadequate screening systems. Ambulatory care pharmacists, integral to team-based T2DM care in many primary care clinics, could address these barriers by performing MASLD risk stratification, though this approach remains untested.

Methods: We conducted a three-month pilot, pre-post study to evaluate a task-shifting intervention to enhance MASLD risk stratification among patients with T2DM in an academic family medicine clinic. The pre-intervention period was Jan-Mar, 2024; the post intervention period was Apr-Jul, 2024. The intervention included these strategies: (1) reassigning MASLD risk stratification from primary care providers to pharmacists managing T2DM patients; (2) pharmacist education on MASLD and risk stratification related workflow; (3) co-location of transient elastography (TE) in family medicine clinic; and 4) internal facilitation (addressing process and workflow related questions, providing progress updates and support). MASLD risk stratification was performed by first computing the Fibrosis-4 (FIB-4) score, a composite blood-based biomarker. If FIB-4 >1.3, patients were referred for TE. Primary outcome was number of visits where FIB-4 was calculated. Secondary outcomes were visits with FIB-4 ≥1.3, referrals for TE, completion of TE, and referrals to Hepatology.

Results: In the pre-intervention period there were 285 pharmacist visits for T2DM management. FIB-4 was available and calculated in 168/285 (58%) with 17/168 (10%) > 1.3. Only one patient was referred for TE, which was not completed. In the post-intervention period, there were 333 pharmacist visits for T2DM management. FIB-4 was calculated in 231/333 visits (69%) with 100/231 (43%) > 1.3. Of 100 visits, 36 (36%) referrals for TE were entered and 34 were completed. Eight patients had liver stiffness > 8 kPa including 5 with liver stiffness > 12 kPa indicating a new diagnosis of cirrhosis. This led to 7 referrals to hepatology.

Conclusion: The task-shifting intervention led to increase in MASLD risk stratification and diagnosis of previously undiagnosed significant fibrosis and cirrhosis in primary care patients with T2DM. Further research is needed to explore barriers, facilitators, and strategies to optimize and sustain this approach.

Category: Clinical research

Mortality Risk by Site of Extrapulmonary Tuberculosis in India: A National Cohort Analysis

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Background: India accounts for 26% of the global tuberculosis (TB) burden and 29% of TB-related deaths. Extrapulmonary TB (EPTB) makes up 15–24% of TB in India, yet mortality risk by anatomical site is poorly characterized.

Methods: We analyzed data from adults (≥15 years) with EPTB reported to India's national TB database between September 2022 and December 2024. We assessed site-specific mortality using multivariable logistic regression to estimate adjusted odds ratios (aORs) for death, controlling for age, sex, body mass index (BMI), HIV status, diabetes, tobacco use, and alcohol use, with lymph node TB as the reference category. We also conducted site-stratified analyses to evaluate the association of HIV, diabetes, alcohol use, and tobacco use with mortality within each EPTB site, adjusting for age, sex, and BMI.

Results: Among 1,029,599 persons with EPTB, 777,512 (75.5%) had outcome data; 23,892 (3.1%) died. Those who died were older (mean 53 vs. 37 years), more often male (62.5% vs. 48.5%), and more likely HIV-positive (6.8% vs. 1.6%). The most common sites were pleural (20.4%), lymph node (18.5%), and abdominal (9.5%). Pleural TB accounted for one-third of EPTB deaths. Tuberculous meningitis (TBM) accounted for just 3.2% of cases but 14.5% of EPTB deaths. TBM carried the highest mortality risk (aOR 12.05, 95% CI: 11.21–12.97), followed by miliary (5.03, 4.38–5.77), and pericardial (3.77, 3.10–4.56). HIV infection was consistently associated with increased mortality across nearly all extrapulmonary TB (EPTB) sites, with the highest adjusted odds observed in "Other" (aOR 5.58), lymph node (aOR 4.86), and miliary TB (aOR 4.26). Diabetes was also strongly associated with higher mortality in genitourinary (aOR 4.55), pericardial (aOR 2.79), and spinal TB (aOR 2.43)—while the effects of alcohol and tobacco use were more smaller and less-consistent across sites.

Conclusion: This is the largest EPTB cohort to date, and it shows that mortality risk varies widely across EPTB sites. Pleural TB, TBM, miliary TB, spinal TB, and pericardial TB account for a disproportionate share of EPTB deaths and require prioritized diagnosis and treatment. EPTB mortality risk is markedly elevated in persons with HIV or diabetes.

Category: Clinical research

Incidence of Outpatient Advance Care Planning and/or Palliative Care for Patients with Idiopathic Pulmonary Fibrosis: 2016-2021

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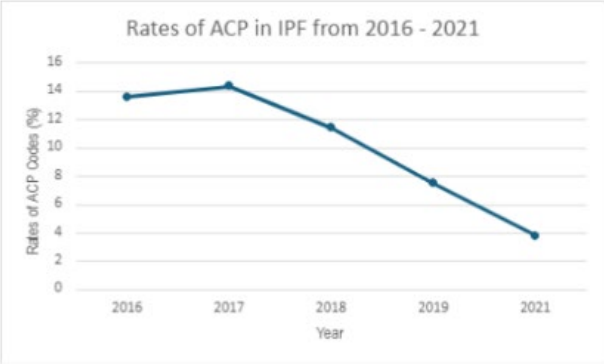
Introduction: Idiopathic pulmonary fibrosis (IPF) has an average life expectancy of 3-5 years. Early advance care planning (ACP) and palliative care (PC) reduce nonbeneficial life-sustaining treatments and improve adherence to preferred location of death in patients with IPF. Accordingly, we assessed use of ACP/PC for patients with IPF in a large US multicenter database.

Methods: Using the TriNetX Research Network (2016-2022), containing deidentified electronic health record and claims data from ≥ 100 million patients at 70 US healthcare organizations, we identified patients (≥ 50 years) with a new diagnosis of IPF (ICD-10 J84.112), defined as ≥ 1 ambulatory visit without IPF followed by at least two ambulatory visits with IPF. We excluded patients with other interstitial lung or connective tissues diseases and those diagnosed in 2022 (ensuring at least one year of follow-up). We evaluated receipt of a charge/diagnosis code for ACP/PC (CPT 99497, CPT 99498, ICD-10 Z51.5; specificity 98%) after first IPF encounter and assessed rates (%) and timing of ACP/PC and annual trends in ACP/PC use by year of IPF diagnosis (Cochrane Armitage trend test). In a multivariable regression model adjusted for baseline hospital and patient level characteristics, we assessed factors associated with ACP/PC.

Results: Among 4749 patients with IPF between 2016-2021, 489 (9.8%) had an encounter for ACP/PC after incident diagnosis. Patients were a median 71 years (range 50-89) and 62.0% male. Among those with an ACP/PC encounter, the median time to ACP/PC was 583 days from incident IPF diagnosis (interquartile range [1st-3rd quartile] = 238-1050 days). Rates of ACP/PC encounters in patients with IPF decreased for patients diagnosed from 2016 to 2021 (p = 0.02) (Figure). Patients with weight loss at diagnosis and metastatic cancer at diagnosis had increased odds of receiving ACP/PC (aOR 1.58 [95% CI 1.1 - 2.23] and aOR 2.31 [95% CI 1.48 - 3.54] respectively).

Conclusions: Receipt of ACP/PC for patients with IPF decreased from 2016-2022. ACP/PC codes have low sensitivity (11%) so true rates may be higher, however coding practices overtime are likely consistent suggesting a real decline. Rising antifibrotic use and perceived improved prognosis over the study period may explain the drop in ACP/PC use. Further, patients with metastatic cancer and weight loss at time of IPF diagnosis were more likely to receive ACP/PC, suggesting that ACP/PC may be driven by diagnoses other than primary lung disease. Future implementation work should focus on improving ACP/PC use in patients with IPF.



Category: Clinical research

Continuous Glucose Monitoring-Enhanced eConsult Improves Clinical Outcomes in Adults Living With Diabetes in a Safety Net Primary Care Setting

Samantha M Siskind, Ryanne Dymek, Kathryn L Fantasia, Katelyn O'Brien, Devin W Steenkamp

Background: There is a shortage of endocrinologists providing diabetes care. Electronic consultation (eConsult) improves access to subspecialty care, but the evaluation of CGM-enhanced eConsults in routine clinical practice has not been reported. We evaluated clinical outcomes after implementing a CGM-enhanced eConsult program in a safety-net hospital primary care clinic.

Methods: We completed a retrospective observational study assessing the clinical impact of the eConsult program. Participants included 67 adults (≥ 18 years) living with diabetes, receiving primary care at Boston Medical Center (mean age 65 years, 40.3% male, 79.1% Black, and 92.5% Type 2 diabetes). Demographic, clinical, and CGM data were analyzed from the medical record and Abbott's LibreView and Dexcom's Clarity web-based applications. Descriptive outcomes within 6 months post-eConsult included time to eConsult completion, hemoglobin A1c (HbA1c) change, medication adjustments, CGM prescription rates, and CGM-derived hypoglycemic metrics.

Results: Mean time to eConsult completion was 5.8 days. Endocrinologist recommendations were implemented in 86.6% of patients at the first primary care visit post-eConsult and in 94.0% of patients within 6 months. Within 6 months, HbA1c was unchanged (mean change 0.2% ± 0.4%). Relative to baseline, sulfonylurea prescription decreased 55.6%. The percentage of those prescribed basal insulin was unchanged, but basal insulin doses decreased in 41.8% of patients. Bolus insulin prescription increased 56.3% relative to baseline. Absolute CGM prescriptions increased from 2.9% at baseline to 49.3%. In 11 CGM users with sufficient CGM data for interpretation at 6 months, Level 1 hypoglycemia (54-69 mg/dL) decreased by 2% and Level 2 hypoglycemia (< 54 mg/dL) decreased by 0.7%.

Conclusion: In adults living with diabetes cared for in a safety-net hospital, CGM-enhanced eConsult provides timely access to endocrinologist expertise, recommendations are widely implemented by primary care clinicians, and guideline-directed modern diabetes therapeutic use increases, including a 17-fold increase in personal CGM prescriptions.

Category: Clinical research

Factors associated with changes in body mass index among people with HIV: Insights from TriNetX database

Nirupa Gadi, Athina Schmidt, Laura Mitten, Clara A. Chen, Emily K Quinn, Gregory Patts, Ivania Rizo, Archana Asundi

Introduction: Weight gain and obesity among people with HIV (PWH) is an ongoing concern and has been associated in some studies with integrase strand transfer inhibitor (INSTI) antiretroviral (ART) medications. We sought to investigate body mass index (BMI) changes among PWH initiating INSTI vs non-INSTI regimens using the nationwide TriNetX database.

Methods: We conducted a retrospective cohort study utilizing the TriNetX Research Network database with records of over 170 million individuals. Adults with HIV initiating ART were isolated and categorized into subcohorts of INSTI vs non-INSTI usage; the control cohort consisted of individuals without HIV matched across a variety of demographics.

Results: Of the ART-naive PWH, both the patients on INSTI vs non-INSTI regimens gained weight, albeit INSTI use was associated with a statistically significant increase in BMI compared to the non-INSTI subcohort in the unadjusted and adjusted analyses, corresponding to a 3% INSTI emergent weight gain. Female sex, later initiation of ART, and longer follow-up periods were also independently associated with greater increase in BMI across the subcohorts, whereas higher baseline BMI and CD4 count appeared protective for increase in BMI. In the matched analyses cohort, PLH experienced significantly greater weight gain and increase in BMI as compared to patients without HIV.

Conclusions: In this large cohort, ART with an INSTI anchor was associated with greater increases in BMI and weight as compared to non-INSTI regimens. The inverse association between baseline BMI and subsequentweight gain supports a potential “return-to-health” effect; however, persistence of weight gain after matching on baseline BMI indicates additional ART- and HIV-related mechanisms. Comorbidities and concomitant non-ART medications, including those used for psychiatric and metabolic conditions, may further influence weight trajectories, highlighting the multifactorial nature of weight gain in this population.

Category: Education/ Clinical Vignette

An Unusual Cause of Altered Mental Status and Vital Sign Changes After Alcohol Withdrawal: Malignant Catatonia

Gregory Gheewalla

Background: Malignant catatonia is a rare, life-threatening neuropsychiatric syndrome characterized by altered mental status, autonomic instability, and motor abnormalities. Its clinical features can overlap with delirium tremens and other causes of encephalopathy, making timely diagnosis challenging.

Case Presentation: A 74-year-old man with a history of alcohol use disorder, PTSD, COPD, heart failure with preserved ejection fraction, paroxysmal atrial fibrillation, type 2 diabetes mellitus, hypertension, and chronic back pain was initially brought to urgent care after being found intoxicated. He was admitted to a detoxification facility but developed progressive agitation, disorientation, and confusion concerning for delirium tremens, requiring escalating doses of intravenous lorazepam and transfer to the hospital.

Due to worsening autonomic instability, including persistent tachycardia and hypertension, and refractory agitation, he was initially admitted to the ICU. He received a phenobarbital load, but remained persistently encephalopathic. Psychiatry was consulted, and adjunctive therapies including valproic acid and haloperidol were initiated without significant improvement. His mental status deteriorated from agitation to somnolence with inability to follow commands and impaired airway protection, necessitating nasogastric tube placement.

His hospital course was further complicated by refractory hypertension and atrial fibrillation with rapid ventricular response despite multi-agent rate control (metoprolol tartrate up to 100 mg QID, diltiazem 15 mg TID, and labetalol 250 mg TID), as well as recurrent episodes of flash pulmonary edema requiring diuresis. Laboratory evaluation including CBC, CMP, and TSH was unremarkable aside from mildly elevated inflammatory markers. Workup for secondary hypertension, neuroendocrine etiologies, and stiff person syndrome was unrevealing. Neuroimaging (CT and MRI brain) and EEG demonstrated no acute abnormalities.

Given persistent altered mental status, diaphoresis, autonomic instability, and episodic apnea with Cheyne-Stokes respiration, malignant catatonia was suspected. He had a Bush Francis Catatonia severity score of 24 (high) and had additional characteristics including rigidity, immobility, grimacing, and minimal responsiveness to stimuli. A trial of escalating lorazepam failed to produce clinical improvement. The patient subsequently underwent a series of seven electroconvulsive therapy (ECT) treatments over two weeks, resulting in marked improvement. His mental status returned to baseline with restoration of orientation and interaction, accompanied by resolution of autonomic instability and de-escalation of antihypertensive and rate-control therapies.

Discussion: This case highlights malignant catatonia as an important and underrecognized diagnosis in patients with presumed refractory alcohol withdrawal. Significant clinical overlap may delay diagnosis, particularly in medically complex patients with concurrent substance use and psychiatric comorbidities. Additionally, it is important to recognize that although catatonia is significantly more common in patients with schizophrenia and other psychiatric disorders, it can also occur due to other significant stressors such as infection, autoimmune disorders, encephalitis, substance use, and medication side effects among other causes. Recognition is critical, as malignant catatonia carries high mortality rate (50-100%) if untreated. It is also important to recognize that treatment with benzodiazepines or ECT (if benzodiazepines fail) provides a great improvement in mortality rate (10-20%).

Category: Education / Clinical vignette

Leptospirosis-induced diffuse alveolar hemorrhage in a 26-year-old male from Central Massachusetts: A Case Report

Joshua C. Grubbs, Christopher Kearney

Case: A 26-year-old male with past medical history of tobacco use disorder presented to the emergency department with several days of fever, myalgias, headache, cough, and progressive dyspnea. Initial labs were notable for elevated creatinine, transaminitis, and thrombocytopenia. Urinalysis was consistent with glomerulonephritis. HIV screening was negative. Computed tomography (CT) imaging of the chest demonstrated diffuse reticulonodular infiltrates. He was empirically started on sulfamethoxazole/trimethoprim for empiric coverage of *P. jirovecii* pneumonia. The patient rapidly developed acute hypoxic respiratory failure over the following 48 hours ultimately requiring endotracheal intubation. Serial bronchoalveolar lavage showed progressive blood return consistent diffuse alveolar hemorrhage. The renal, rheumatology, and infectious disease consult services remained engaged and formulated a plan to empirically treat for pulmonary-renal syndrome using pulse dose steroids and plasma exchange. Antibiotics were escalated to vancomycin, cefepime, and doxycycline to broadly cover pulmonary pathogens in addition to potential tick-borne disease given the concurrent thrombocytopenia and transaminitis. *Leptospira* PCR from bronchoalveolar lavage sample returned positive. The patient was continued on doxycycline therapy and successfully extubated several days later.

Discussion: Diffuse alveolar hemorrhage is a rare complication of leptospirosis. The patient's negative travel history and the region's low prevalence of leptospirosis made this a challenging diagnosis that ultimately revealed itself only after the resolution of the patient's acute illness. The empiric addition of doxycycline to broadly cover for arthropod-borne disease fortunately treated his infection before the team had serologies to direct antibiotic therapy.

This patient's care demonstrated the importance of a multidisciplinary approach to care for complex patients and the value of pattern-recognition and schemas to form a differential and direct empiric treatment while diagnostic data remained scarce. Specifically, the iterative search for a unifying diagnosis that explained the patient's multi-system organ failure yielded a plausible explanation – i.e. arthropod-borne disease – and facilitated a treatment plan that prevented further clinical deterioration and death.

Category: Clinical research

Unmasking the Variability: Accuracy and Bias of Cardiac Output Measurements Across Fick and Thermodilution Methods

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Background: The gold standard methods of invasive cardiac output (CO) calculation—the Fick principle and thermodilution (TD) have unique strengths and limitations. Discrepancies between methods are often noted clinically, yet little data describes how accuracy between methods differs based on patient characteristics.

Objective: To compare relative accuracy of three methods (Dehmer, Bergstra, LaFarge) of estimated Fick (eFick) and TD CO to direct Fick (dFick) CO using measured VO2 from invasive cardiopulmonary exercise testing (iCPET) and to identify patient factors associated with discrepancies between CO methods.

Methods: A total of 168 adults were referred for iCPET with pulmonary artery catheters. Measured VO2 by a metabolic cart was used to calculate direct Fick, and TD was simultaneously collected. Dehmer, Bergstra, and LaFarge were calculated via established equations. Statistical analysis was conducted to compare each method to dFick and identify potential influential patient characteristics.

Results: The cohort was 63% female, 59% non-white, with high prevalence of hypertension (63%) and obesity (60%). 20% had known HF and 5.4% with reduced ejection fraction. Median CO by method were the following: dFick 4.86 (IQR 3.94 - 5.97) L/min, Dehmer 4.59 (IQR 4.09-5.29), LaFarge 3.79 (IQR 3.2-4.47), Bergstra 5.06 (IQR 4.49-5.95), and thermodilution 5.10 (IQR 4.45 – 6.00) L/min. LaFarge significantly underestimated dFick compared to other methods. All methods of indirect Fick demonstrated negative proportional bias according to CO. Thermodilution demonstrates consistently large and unpredictable spread across the range of CO (Figure 1). Cluster analysis identified patient characteristics such as race, sex, and geriatric status, modestly correlated with overestimation of dFick, some of which were also seen in multivariable analysis.

Conclusions: It is recommended to use estimated Fick and thermodilution in tandem when approximating cardiac output, particularly at extremes of CO. Our study elucidates patient characteristics for whom accuracy of methods warrants further examination in larger data sets. Further study is needed, including consideration of new methods of modeling VO2 consumption, in larger databases across a variety of clinical contexts, care settings, and diverse patient populations.

Category: Clinical research

Outcomes of patients treated with darolutamide for metastatic castration-resistant prostate cancer

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Introduction: Second and third generation androgen receptor blockers have been demonstrated to improve survival in various settings in advanced prostate cancer and include enzalutamide, apalutamide, and darolutamide. Darolutamide is a third-generation androgen receptor blocker with fewer neurotoxic side effects compared to other medications in its class but is not currently FDA approved for use in metastatic castration-resistant prostate cancer (mCRPC). The goal of our study is to examine a single institution's use of off-label darolutamide in the mCRPC setting.

Methods: We conducted a retrospective chart review of all patients age 18 years or older with mCRPC who were initiated on darolutamide at Boston Medical Center from 7/1/19 to 1/31/24. Primary outcomes focused on dose reduction, duration of therapy, disease response, and adverse events.

Results: Patients who met our study criteria (N=48) were primarily Black and English-speaking, and had stage IVb prostate cancer at diagnosis. Almost half had a history of falls. These patients received on average 2.5 lines of therapy prior to darolutamide (most commonly androgen synthesis inhibitors, ADT monotherapy, first and second-generation androgen receptor inhibitors, and taxane-based chemotherapies). Patients were on average 78y old at the time of darolutamide initiation, and 77% were started on darolutamide because it was felt to have a favorable side effect profile. 3 patients required dose reductions for significant fatigue, neutropenia, and headaches. The most common side effects patients experienced were mild-moderate fatigue (69%), GI discomfort (15%), and hypertension (10%). 4 patients died while on darolutamide, though none of these deaths were thought to be from darolutamide. While on darolutamide, 38% of patients had a partial response, 40% had stable disease, and 22% progressed. After darolutamide, 23% of patients transitioned to hospice, and 33% went on to receive additional lines of therapy.

Best Response	Median Time to Progression (months)	Median overall time on darolutamide (months)	Median survival on darolutamide (months)
Partial (N=17)	5.73	8.97	13.17
Stable (N=18)	6.08	10.02	21.02
Progression (N=10)	2.08	2.35	7.32

Conclusions: Patients who were treated with darolutamide for mCRPC tended to be frail older adults who had received multiple prior lines of therapy. Darolutamide was felt to be a good treatment option in these patients given its favorable side effect profile and patients tolerated it well with mild side effects; only 3 required dose reductions. Most patients had either a partial response or stable disease on darolutamide, and remained on darolutamide for almost a year. This is promising in demonstrating that darolutamide is a well-tolerated option for advanced prostate cancer, particularly in frail older adults who may have limited ability to tolerate more intensive regimens.

Category: Education / Quality Improvement

Improving Safe Use of Phenobarbital in Alcohol Withdrawal Through EMR Redesign

Jyla Hicks MD, Ramya Singhal MD, Matthew Ronan MD, David Thorton MD

Background: Alcohol withdrawal is a common reason for hospitalization within the West Roxbury Veteran Affairs (VA) system. Standardized protocols, including CIWA based assessment and phenobarbital use aim to guide treatment however reliance on protocol driven care without appropriate clinical context may lead to treatment of intoxication rather than true withdrawal leading to increased risk of oversedation and adverse events.

Local Problem: At the West Roxbury VA medical center, a pattern of premature treatment of alcohol withdrawal was identified, including administration of phenobarbital in patients without objective signs of withdrawal. In one representative case, a patient with a serum ethanol level of 403 mg/dL and no clinical evidence of withdrawal received multiple doses of phenobarbital based on protocol alone. System level data demonstrated high utilization of phenobarbital (~65% of admissions for alcohol withdrawal), raising concern for inappropriate use.

Methods: A root cause analysis was performed using a systems base framework. Key drivers included overreliance on CIWA scoring despite patient nonparticipation, ambiguous protocol language and lack of safeguards within the electronic medical record (EMR) ordering system. Interventions focused on redesigning the phenobarbital order set within the EMR to include clear eligibility criteria and decision support prompts.

Intervention: The EMR order set was modified to require documentation of active alcohol withdrawal prior to phenobarbital ordering including ability to participate in CIWA assessment, recent CIWA documentation and presence of object withdrawal signs. Additional warnings were added to discourage use in active intoxication and clarify that treatment is indicated for active withdrawal rather than prophylaxis.

Results: The intervention introduced system level safeguards to reduce inappropriate phenobarbital administration and standardize care. Early feedback suggests improved clinical decision making and increased awareness of the distinction between intoxication and withdrawal.

Conclusions: EMR based interventions can address predictable safety gaps not mitigated by education alone. Embedding clinical decision support within order sets may reduce inappropriate treatment and improve safety in alcohol withdrawal management.

Category: Education / Clinical vignette

An Uncommon Culprit: Delayed Recognition of Methanol Toxicity in a Geriatric Patient

Kerman, Sophia

Case: 78-year-old woman with dementia (last MoCA 12/30), CKD stage 3, and hypertension presented to the ED after she was found mumbling incoherently in the family's shed. This was a drastic change from baseline of clear communication. On arrival, patient was confused but without focal neurological deficits. Collateral from family was unremarkable. Head CT showed no acute intracranial abnormalities. Urine toxicology screen was negative. VBG with pH 7.29, HCO3 23. Nursing noted newly unequal pupils. CTA was unremarkable. Patient grew agitated and unable to cooperate for exam, so MRI obtained, which showed restricted diffusion in bilateral putamen consistent with acute infarcts, pathognomonic for methanol toxicity. At the time of MRI results, ~36 hours since admission, patient was found to be only responding to noxious stimuli. Repeat labs with serum osmolality 383, osmolal gap 87.0, pH <7.0, HCO3 <10. Patient developed pulseless electrical activity. ROSC achieved, but imaging showed diffuse cerebral edema. Patient received fomepizole and started on CVVH. Methanol level resulted at 170 mg/dL. Patient's family opted to discontinue treatment and she expired.

Impact/Discussion: While an uncommon cause of altered mental status (AMS), methanol intoxication is a "can't miss" diagnosis. If treatment is delayed, mortality can exceed 40%. While methanol itself is relatively nontoxic, its metabolite formic acid causes profound anion gap acidosis, ophthalmologic damage, and basal ganglia injury. These fatal sequelae can develop in less than 72 hours. Patients with dementia are at risk of accidental methanol ingestion, as it is present in household items (e.g. inks/dyes, adhesives, antifreeze, cleaning products). Doses as low as 15 mL can lead to morbidity and mortality. Identifying methanol toxicity is diagnostically challenging, as their physical exam findings are non-specific, and early labs are typically unremarkable. Serum osmolality is helpful in identifying methanol poisoning as the osm gap is elevated earlier and declines as methanol metabolizes, one of few lab abnormalities present in early illness. Putamen necrosis, seen on MRI here, primarily occurs due to toxic effects of formic acid, and thus occurs later in the course of presentation.

Conclusion: Methanol ingestion should be considered in patients with dementia and AMS because of high risk of accidental ingestion and devastating consequences of late diagnosis. In advanced methanol poisoning, patients may develop afferent pupillary defect. The anisocoria noted in this case is atypical, but visual defects in patients with confusion should raise concern for methanol toxicity. Immediate treatment with fomepizole or ethanol can prevent alcohol dehydrogenase from metabolizing methanol to highly toxic metabolite formic acid. Once formic acid is in the bloodstream, dialysis is required. This case shows both the necessity and the challenges of timely diagnosis of methanol toxicity, particularly for dementia patients experiencing AMS.

Category: Clinical research

Preventive pharmacotherapy initiation after Lipoprotein(a) measurement in low-risk adults

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Introduction: Lipoprotein(a) [Lp(a)] is a genetically determined lipoprotein particle and an established cardiovascular risk factor for atherosclerotic cardiovascular disease (ASCVD). Elevated Lp(a) confers cardiovascular risk independent of traditional lipid parameters such as low-density lipoprotein cholesterol (LDL-C) and affects 20-25% of the worldwide population.

Although current guidance recommends single lifetime Lp(a) measurement, no pharmacologic intervention is approved. With increasing guideline-directed Lp(a) testing, clinician response to elevated concentrations, especially in the absence of guideline-based treatment indications, remains unclear.

We examined initiation of lipid-lowering therapy, proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitors, and aspirin following Lp(a) measurement among adults without established ASCVD or other high-risk conditions.

Methods: We conducted a multicenter retrospective observational cohort study evaluating initiation of preventive pharmacotherapy following Lp(a) measurement using the TriNetX Network. Adults aged 18-75 years with an ambulatory Lp(a) measurement between January 1, 2021, and January 1, 2026 were included [7, 8]. We excluded patients with multiple high-risk diagnoses, lab values, and medication prescriptions. Medication prescription 90 days after Lp(a) measurement was compared among groups of elevated and non-elevated Lp(a); elevated concentrations were ≥50 mg/dL or ≥125 nmol/L, while non-elevated concentrations were <50 mg/dL or <125 nmol/L, in keeping with consensus guidelines. Patients were matched 1:1 using greedy nearest-neighbor matching.

Results: After matching, 14,969 patients remained in each group. Baseline characteristics were similar. Within 90 days of Lp(a) measurement, lipid-lowering therapy initiation was uncommon but more frequent among patients with elevated Lp(a) compared to those with non-elevated Lp(a) (3,210 [21.4%] vs 1,401 [9.4%]; RR, 2.29 [95% CI, 2.16-2.43]); absolute risk difference 12.1% (95% CI, 11.3%-12.9%). Most initiations were statins (3,118 [20.8%]). PCSK9 inhibitor initiation was rare but more frequent among patients with elevated Lp(a). Similarly, aspirin initiation was uncommon but more frequent among patients with elevated Lp(a).

Conclusion: In this contemporary U.S. cohort of lower-risk adults, elevated Lp(a) was associated with earlier and more frequent initiation of preventive pharmacotherapy. However, absolute prescription rates were modest. These findings suggest that elevated Lp(a) appears to occasionally influence prescribing behavior - consistent with recent reports.

A limitation is the inability to calculate the pooled cohort equation or PREVENT risk scores. Some patients without ASCVD may nonetheless meet lipid-lowering eligibility thresholds based on estimated 10-year risk.

These findings underscore the heterogeneity of contemporary management and highlight the need for evidence-based guidance.

Category: Education / Clinical vignette

Reverse Rim, Irreversible Injury: Renal Cortical Necrosis Following Tranexamic Acid Use in Nonobstetric Hemorrhage

Danielle Lafond MD, Joyita Bharati MD, Deepthi Gunasekaran, MD

Learning Objectives:

- Recognize the pathognomonic imaging evidence of renal cortical necrosis
- Discuss patient characteristics and exposures of this patient that could potentially increase the risk for renal cortical necrosis

Background: Bilateral renal cortical necrosis (RCN) has been documented after administration of tranexamic acid (TXA) in both obstetric and non-obstetric scenarios. Contrast CT imaging demonstrating reverse rim-sign is pathognomonic for this condition, and a significant portion of patients progress to ESRD with only 25% of patients demonstrating return of kidney function. Below we describe a case of a patient with this CT finding after a relatively low oral dose of TXA.

Case: A 54 year old female with a past medical history of uterine fibroids was seen in an outpatient clinic by her gynecologist due to uncontrolled abnormal uterine bleeding (AUB). She had previously failed norethindrone 15mg and was initiated on oral tranexamic acid 1300mg TID for up to 5 days. On day 1, she took 1 tab of 650mg in the day and 2 tabs totaling 1300mg at night. On day 2, she presented to the emergency room with continued bleeding and was found to have Cr 2.21 mg/dL from a prior baseline of 0.60 mg/dL (last measured 17 days prior). She received a dose of 1000mg TXA IV in the emergency room due to continued vaginal bleeding and symptomatic anemia to Hgb 5.4 without hemodynamic instability. Contrast enhanced CT abdomen and pelvis then showed bilateral reverse rim-sign, a finding highly suggestive of bilateral RCN for which a renal consult was placed. Initial labs were somewhat consistent with hemolysis showing schistocytes on smear, elevated LDH, and low haptoglobin, but other coagulopathy labs were negative. Renal failure progressed and she became anuric, requiring dialysis within the next 48 hours. Eventually patient underwent D&C in order to definitively manage persistent bleeding, had a tunneled dialysis catheter placed, and was discharged with a plan for outpatient dialysis.

Impact / Discussion: While prolonged bleeding itself can lead to RCN, it has most often been associated with post-partum hemorrhage or prolonged hypotension. DIC has also resulted in RCN, but this patient did not have labs or a clinical picture consistent with DIC. In this patient, the risk of thrombosis may have been increased prior to TXA administration by high dose progesterone therapy for AUB. This case demonstrates that RCN may be a sequelae of relatively low dose oral tranexamic acid in certain non-obstetric patient populations. It also demonstrates that early involvement of renal consult based on CT findings pathognomonic for RCN is essential to hospital management and proper discharge planning for these patients.

Category: Clinical research

Evaluating the Atherogenic Index of Plasma as a Prognostic Indicator for Readmission Risk in Heart Failure Patients: A Retrospective Cohort Study

Grace Lee, MD, Tae Kyung Yoo, MD, Seung Wook Lee, MD, Satoshi Miyashita, MD

Aims: Among patients who are hospitalized with heart failure (HF), about 50% have readmissions within 6 months. The impact of atherogenic index of plasma (AIP) and low-density lipoprotein cholesterol (LDL-C) on HF readmission risk is unclear. Our study aims to determine if there is an association between AIP, LDL-C and readmission rate for HF.

Methods: We used a public dataset of patients hospitalized with a prior or new diagnosis of HF in Zigong Fourth People's Hospital in China between 2016 to 2019 (https://doi.org/10.13026/5m60-vs44). AIP was categorized into <0.11 (normal risk), 0.11-0.21 (intermediate risk), and >0.21 (high risk). The association between AIP and 6-month readmission rate was explored through a Cox proportional hazard analysis with a crude model, one adjusted for age, gender, and BMI (Model 1), and one adjusted for additional variables such as type of HF, guideline-directed medical therapy, New York Heart Association cardiac function classification (fully adjusted model). The association between LDL- C tertile (≤1.46, 1.462.1 mmol/L) and readmission rate was also analyzed with the same adjustments. Competing risk analysis for mortality was done using the Fine-Gray model.

Results: A total of 1805 patients were included. There was no significant association between AIP level and readmission rate in the crude model (HR 1.03, 95% CI 0.93-1.14), Model 1 (HR 1.05, 95% CI 0.95-1.17), fully adjusted model (HR 1.03, 95% CI 0.95-1.18), and the Fine-Gray model (HR 0.99, 95% CI 0.94-1.05). In contrast, the higher LDL-C tertile was associated with decreased readmission risk in the crude model (HR 0.87, 95% CI 0.79-0.96) and Model 1 (HR 0.89, 95% CI 0.80-0.97). This association was no longer statistically significant in the fully adjusted (HR 0.93, 95% CI 0.84-1.03) and Fine-Gray model (HR 1.02, 95% CI 0.97-1.08).

Conclusion: In this Chinese cohort of hospitalized HF patients, we found no significant association between AIP levels and 6-month readmission rate, even after extensive clinical covariate adjustment and accounting for competing mortality risk. Lower LDL-C level showed a modest trend toward reduced readmission in unadjusted models but this association was not sustained after full adjustment. These findings suggest that AIP and LDL-C may have limited utility as independent predictors of 6-month HF readmission rates. Future research is warranted to evaluate the role of AIP and LDL-C level in long-term HF outcomes.

Category: Clinical research

Racial and Ethnic Comparisons in IBD Treatment Outcomes: A Safety-Net Hospital Experience

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Introduction: Racial and ethnic minority groups have been underrepresented in clinical trials evaluating efficacy of many of the biologic and small molecule therapies used to treat inflammatory bowel diseases such as Crohn's and ulcerative colitis. This lack of representation has resulted in limited data on clinical response rates seen in these patient populations. Our study aims to assess whether response rates to biologic therapies differ among patients with IBD that are of diverse racial and ethnic backgrounds.

Methods: We performed a retrospective chart review of 489 patients with IBD on biologic therapy at Boston Medical Center, an urban safety net hospital. Data collected included each patient's first dose of biologic or small molecule therapy and date of clinical remission, as defined by disease-specific symptom severity scoring indices (HBI <4, DAI ≤2, SSCAI ≤2.5). Survival analysis was performed to compare the time to achieve clinical remission amongst patients of different ethnic and racial backgrounds.

Results: Of the 489 patients on biologic therapy, 285 patients achieved clinical remission and 121 patients did not by the end of the study period (12/31/2023). A survival analysis including patients that did and did not achieve clinical remission did not show a statistically significant difference between racial and ethnic groups ($p = 0.81$). Similarly, amongst patients who did achieve clinical remission, the average amount of time required to reach remission did not differ significantly between groups ($p = 0.45$).

Conclusion: Historically, patients of minority racial and ethnic groups have been underrepresented in studies of biologic and small molecule therapies. We were able to study a patient population that closely represents the racial and ethnic diversity of the United States in the setting of a safety net hospital where patients of all backgrounds had equal access to therapy despite insurance status. The results of this study highlight that when access to treatment is not restricted, patients of all backgrounds have similar chances of achieving disease control. The disparities in patients' access to equal and effective treatment can have lasting impacts on their morbidity and mortality, therefore we hope that future efforts can focus on minimizing or eliminating such inequities.

Category: Clinical Vignette

Unilateral Adrenalectomy in a Patient With Overt Cushing Syndrome Caused by Primary Bilateral Macronodular Adrenal Hyperplasia: A Temporizing Measure

Liang, Kevin

Background: Primary bilateral macronodular adrenal hyperplasia (PBMAH) is a rare cause of Cushing syndrome (less than 2% of cases) often discovered incidentally by imaging tests. Bilateral adrenalectomy is currently the recommended treatment for PBMAH causing overt Cushing syndrome (24-hour urine cortisol > 2-3 times the upper limit of normal [ULN]), but this can be a difficult decision for asymptomatic patients since the resulting adrenal insufficiency requires lifelong steroid replacement and carries long-term risks.

Case: A 36-year-old woman from South America who presented to the ED with abdominal pain and vomiting was diagnosed with diabetic ketoacidosis, with glucose of 431 mg/dL (70-100 mg/dL), hemoglobin A1C of 10.7% (4.0-6.0%), pH of 7.11 (venous, 7.32-7.42), an anion gap of 22 (7-16) and ketonuria. Abdominal CT showed an incidental finding of multiple bilateral adrenal nodules, with the largest in the right adrenal measuring 1.7 cm and the largest in the left measuring 1.8 cm. Despite being generally asymptomatic prior to admission, she was subsequently diagnosed with ACTH-independent Cushing syndrome caused by PBMAH, with a positive overnight 1 mg dexamethasone suppression test (cortisol level of 23.2 µg/dL, n<1.8 µg/dL), 24-hour urine cortisol of 291.4 µg/day (4.0-50.0 µg/day) and ACTH level of 6 pg/mL (6-50 pg/mL). Adrenal vein sampling and aberrant receptor testing were deferred, as neither was likely to affect management. Genetic testing for *ARMC5* and *KDM1A* gene mutations were sent. After discussion with the patient, a decision was made to first proceed with a unilateral adrenalectomy to avoid the immediate need for steroid replacement. She subsequently underwent a left adrenalectomy, and a 1-day post-op morning cortisol level was 13.6 µg/dL (4.0-23.0 µg/dL). Her hyperglycemia was noted to have improved 1 month post-op, on continued treatment with insulin glargine and dulaglutide.

Discussion: Although PBMAH more commonly presents as mild autonomous cortisol secretion, the patient's 24-hour urine cortisol at the time of diagnosis was nearly 6 times the ULN, consistent with overt Cushing syndrome. Despite bilateral adrenalectomy being the recommended treatment in this case, a unilateral adrenalectomy was performed initially (as part of a staged surgical approach) to avoid the immediate development of adrenal insufficiency. While a future right adrenalectomy will be required, the patient's clinical stability and improved glycemic control suggest a staged approach to adrenalectomy may reasonably be considered in some cases of overt Cushing syndrome caused by PBMAH. A post-op 24-hour urine cortisol will guide timing of the eventual right adrenalectomy and may inform a possible role for pharmacological bridging strategies. This case underscores the importance of shared decision-making with patients and highlights the management challenges of PBMAH.

Category: Clinical research

Sex-Based Differences in Outpatients with Irritable Bowel Syndrome at a Large Safety Net Hospital

Jacqueline Liu, Kathleen Cheng, Howard J. Cabral, and Horst C. Weber

Introduction: Irritable bowel syndrome (IBS) is a highly prevalent disorder of gut-brain interactions (DGBI) with significant negative impact on quality of life and health care expenditure. There is a female association, but a large knowledge gap exists regarding sex-based differences of IBS comorbidities and their distribution across racial groups. The aim of this study was to investigate sex-based differences in IBS patients from a large multiracial population in a large safety net hospital.

Methods: An electronic query of the data warehouse was performed using ICD-9 codes to enroll unique outpatients with IBS at Boston Medical Center (BMC) between January 1, 2005 and September 30, 2007. Comorbidities were determined using ICD-9 codes and demographic data was collected from the electronic medical records. Chi-square, Fischer's exact, and two-tailed t-test were used for statistical calculations.

Results: A total of 740 IBS patients were enrolled, including 555 female (75%) and 185 male (25%) patients. Demographic data for race/ethnicity, marital status, children status, and insurance status did not differ between male and female IBS patients (Table). The smoking status of IBS patients differed with more former male smokers as compared to former female smokers (23% vs 14%). Significant disparities existed in educational level with a higher proportion of male patients having graduate degrees compared to female patients (59% vs 47%). More male IBS patients (37%) were in a fulltime employment compared to female IBS patients (26%). There was a significant association of female sex with depression (29% vs 19%, p=0.008) and anxiety (24% vs17%, p=0.033). Furthermore, anxiety was significantly more prevalent in White female patients compared to non-White female patients (75% vs 25%; p=0.017). No sex-based differences of comorbidities were present in patients from different racial groups including anorexia and bulimia and gastrointestinal disorders such as GERD, NUD, diverticulosis, constipation, and PUD.

Conclusion: This study demonstrated highly significant sex-based and racial differences for depression and anxiety in IBS patients at a racially diverse safety net hospital. These findings may be attributed to differences in hormonal variation and neuroplasticity between male and female patients and disparities in healthcare utilization. Our data supports that anxio-depressive symptoms in female IBS patients might increase IBS severity and should be targeted for improved clinical management.

Category: Clinical research

THRIVE Ecuador: Reconnecting Communities with Health Services in Rural Ecuador

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Background: Rural and peri-urban communities in Ecuador face substantial barriers to healthcare access, including limited awareness of services, distrust in the public system, fragmentation of care, and sociocultural divides between biomedical and traditional medicine. These challenges contribute to poor health outcomes and persistent inequities. Community-engaged approaches are needed to better understand and address this disconnect.

Objective: To conduct a community-based diagnostic assessment to characterize barriers, resources, and health-seeking behaviors in Carapungo, Quito, and to inform the development of a culturally responsive intervention to reconnect patients with existing health services.

Methods: This ongoing mixed-methods study integrates a cross-sectional analytical design with qualitative ethnographic methods. Stage 1 focuses on community engagement, mapping, and tool development. Data collection will include 20–30 semi-structured interviews and 4–6 focus groups with community members, healthcare providers, and traditional healers, incorporating both qualitative and embedded quantitative measures.

Preliminary fieldwork (August 2025) involved immersive engagement within Centro de Salud Carapungo 2, including observation of clinical encounters, participation in community outreach ("barridas"), attendance at community leadership meetings, and discussions with local stakeholders across healthcare and public health sectors. These activities informed refinement of study instruments and stakeholder identification.

Results (Preliminary/Expected): Early-stage results center on successful community engagement and relationship-building. The research team established partnerships with clinicians, public health leaders, and community representatives, and identified key demographic and structural characteristics of the local health system. Through direct engagement—meeting community leaders and members, observing clinical care and community meetings, and presenting the project's goals—community members demonstrated openness and willingness to participate in the project.

These interactions enabled identification of key barriers, including care fragmentation across health centers and gaps in preventive services, while also guiding the iterative development of culturally appropriate conversation guides. This engagement process represents a critical early outcome, laying the foundation for data collection and future intervention design.

Expected outcomes include comprehensive mapping of biomedical and traditional services, characterization of barriers and health behaviors, and co-development of a community-informed intervention to improve healthcare access and integration.

Conclusions: The THRIVE Ecuador project demonstrates the feasibility and value of early, immersive community engagement as a foundational step in global health research. This approach supports the development of culturally grounded, sustainable strategies to improve healthcare access in underserved populations.

Category: Education / Clinical vignette

Case report of a transcatheter pulmonic valve-in-valve replacement through a bioprosthetic tricuspid valve in a patient with carcinoid heart disease

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Introduction: Carcinoid heart disease (CHD) is a paraneoplastic syndrome that occurs in patients with metastatic neuroendocrine tumors (NETs), often resulting in right-sided valvular dysfunction and heart failure. Surgical valve replacement is the main treatment for CHD with valvular involvement, though many patients will eventually develop prosthetic valve degeneration.

Case Description: We present a case of a 70-year-old female with metastatic NET, complicated by CHD status post-surgical tricuspid and pulmonary valve replacement who presented with dyspnea. She was found to have worsening right-sided heart failure in the setting of severe bioprosthetic pulmonic valve regurgitation. Given the patient's metastatic NET, prior sternotomy, and overall frailty, it was felt that surgical valve replacement would portend prohibitively high risks. In turn, the patient underwent transcatheter pulmonic valve-in-valve replacement via a bioprosthetic tricuspid valve. Post-deployment trans-esophageal echocardiography showed good pulmonic valvular function with no paravalvular leak, reduction of PR to mild, and reduction in the mean gradient from 15 to 4 mmHg. There was no evidence of damage to the bioprosthetic tricuspid valve.

Discussion: This is the only case, to our knowledge, of a CHD patient undergoing percutaneous pulmonic ViV replacement through a bioprosthetic TV, without simultaneous tricuspid ViV replacement. This presents several unique technical challenges. First, the presence of a prosthetic TV may hinder appropriate positioning and deployment of the PV. Compared to the prior cases of simultaneous tricuspid and pulmonic ViV replacements for severe TR and severe PR, in the case of our patient with moderate TR and severe PR, one notable challenge was to navigate the bioprosthetic TV with our sheath without compromising the existing bioprosthetic TV structure and in turn worsening TR. The presence of significant RV remodeling in our patient further exacerbated the difficulties of valve deployment. Furthermore, in general, plaques characteristic to CHD distort the anatomy of the bioprosthetic valve, making it difficult to position the valve and create an adequate seal during deployment. Finally, compared to native percutaneous valve replacements, ViV replacement presents added challenges in sizing, positioning, and implanting the valve, which increases the risk of complications such as coronary obstruction, valve migration, and high residual gradients. Our case demonstrates the feasibility of pulmonic ViV replacement via a prosthetic TV in CHD, despite the many technical challenges. This case demonstrates the feasibility, safety, and short-term efficacy of bioprosthetic valve-in-valve interventions in patients with CHD with bioprosthetic valve degeneration.

Category: Education / Clinical vignette

Sweet hair day: a rare presentation of a rare disease

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Background: Sweet syndrome (SS) is an acute neutrophilic dermatosis characterized by tender erythematous plaques, papules, or nodules and associated with dense inflammatory infiltrates on histopathology and elevated inflammatory markers. It is classified into three subtypes: classical (idiopathic), malignancy-associated (MSS), and drug-induced. Hairy cell leukemia (HCL) is a rare B-cell lymphoproliferative disorder marked by cytoplasmic projections and infiltration of the bone marrow, spleen, and peripheral blood, often presenting with cytopenias and/or splenomegaly.

Case presentation: A 64-year-old female presented with acute onset rash (Figure 1a, 1b, 1c), fever, and arthralgias. Laboratory evaluation revealed pancytopenia and elevated inflammatory markers, with negative infectious and autoimmune workup. Skin biopsy showed a non-infectious inflammatory infiltrate composed of lymphocytes, histiocytes, and scattered eosinophils. (Figure 2). Peripheral smear (Figure 3) identified circulating hairy cells, and bone marrow biopsy confirmed HCL. The overall findings were consistent with HCL-associated Sweet syndrome.

Objective: To describe the presentation, treatment, and outcomes of hairy cell leukemia (HCL)- associated Sweet syndrome.

Methods: A retrospective literature review was conducted using the PubMed, MEDLINE, Scopus, and Google Scholar databases with the keywords “Sweet syndrome”, “hematologic malignancy,” and “hairy cell leukemia”. English-language articles published through May 2025 were included.

Results: MSS accounts for approximately 15–20% of SS cases, with ~87% associated with hematologic malignancies, most commonly acute monocytic leukemia. Only 10 cases of HCL-associated MSS have been previously reported. These cases typically present with rapidly evolving, painful erythematous plaques or nodules and demonstrate variable histopathologic patterns. Cutaneous manifestations generally resolve with treatment of the underlying malignancy.

Conclusions: Acute-onset rash should prompt evaluation for MSS as a potential indicator of occult or recurrent malignancy. MSS may precede, coincide with, or follow cancer diagnosis. In patients presenting with cytopenias, evaluation for underlying hematologic malignancy is critical. Recognition of this association is essential, as dermatologic findings often improve with malignancy-directed therapy.

Figure 1. Skin rash of the 1A) knees, 1B) forearm, 1C) face

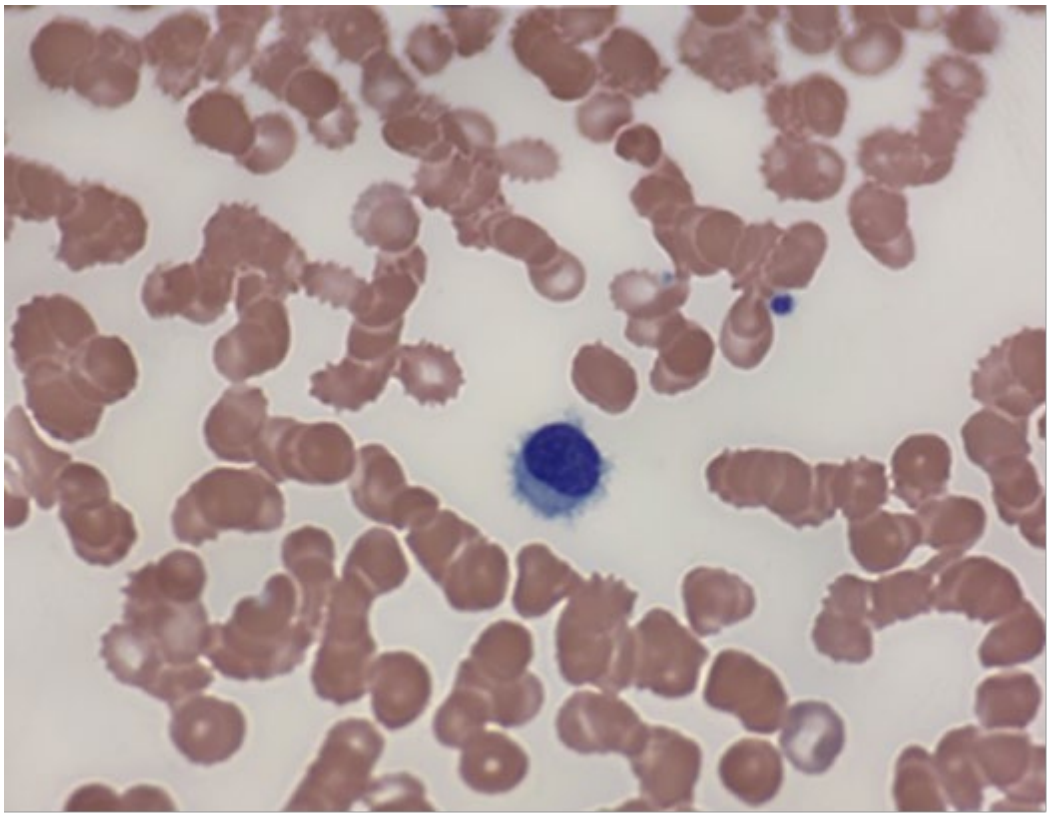
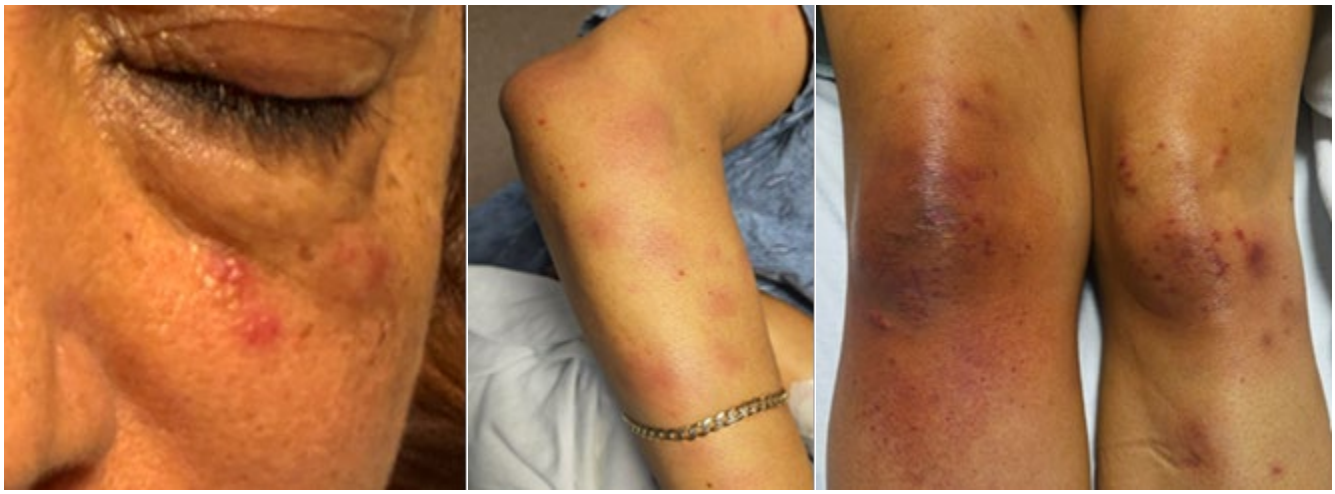


Figure 3. Peripheral blood smear with circulating hairy cells

1A 1B 1C



4A 4B

Category: Education / Quality Improvement

IRHC Outreach Initiative to Increase Initial Visit Show Rate

Jason McLean, MD MPH; Lucy Witchell, MD; Alexa Tabackman, MD; Sarah Kimball, MD

Introduction: For the last few years, there has been a perception by Immigrant and Refugee Health Center (IRHC) providers that new IRHC visit no show rates were unusually high. This was particularly worrisome because immigrants and refugees, being a vulnerable population, were at higher risk of having their medical and social problems go unaddressed. Alumni Lucy Witchell, MD and Alexa Tabackman, MD performed initial work on this to quantify show rates and identify medical, psychiatric, and case management needs that these patients have. The theory was that a call serving as an initial touch point would identify these issues and potentially intervene on them even prior to their first visit. My work was to continue to build this data set and identify factors that may be contributing to low show rates.

Methods: Patient were initially called about 1 week from their first IRHC visit. During this call, information regarding acute and chronic medical concerns, mental health concerns, and case management concerns (namely housing, food, and transportation insecurity) was recorded. If information gleaned during this call warranted immediate follow up (such as with the IRHC provider with which the patient had an appointment, Psychiatry, or Case Management), then these parties would be engaged via staff message.

Results: Averaged across the months of January through March 2026, the average show rate was 64%. Data collection ran from April 1, 2026, to April 28, 2026. The show rate of those who answered the phone call prior to their appointment was 83%. 66% of patients called had an actionable concern prior to their appointment that prompted immediate follow up with one of the services mentioned above prior to their scheduled appointment. 33% of patients called either were not aware of their upcoming IRHC appointment, were unsure about its purpose, or believed it to be at a different time

Conclusion: Preliminary data suggests that patient calls are an effective method of increasing new IRHC show rates and frequently have actionable findings that prompt expediting follow up with relevant services. It remains to be seen if these trends persist over time. Assuming this is the case, it will need to be determined who is best suited to bear the responsibility of making these calls prior to patient appointments.

Category: Clinical research

Smoking Increases 30-Day Readmission in Advanced-Stage Lung Cancer: A Safety-Net Hospital Cohort

Newton, Emma; Dinc, Mehmed Taha; Wang, Shiting; Tapan, Umit

Background: Unplanned hospital readmissions are a major driver of healthcare costs and patient distress, and strategies to lower their incidence are a priority for improving the quality of care delivered to patients with cancer. This study aimed to identify predictors of 30-day unplanned readmission among patients with lung cancer at a large, academic urban safety-net hospital.

Methods: A retrospective cohort study was conducted involving 105 patients with lung cancer and an unplanned index admission between January 2021 and June 2024. The primary outcome was 30-day unplanned readmission. Bivariate analyses were performed for clinical, demographic, and twelve social determinants of health (SDOH) variables. A multivariable logistic regression Firth's penalized likelihood method was used to analyze the association between patient characteristics and readmission, focusing on an interaction between smoking status and cancer stage.

Results: The overall 30-day unplanned readmission rate was 41.9%. In bivariate analyses, no individual SDOH variable was significantly associated with readmission, though a consistent trend was observed wherein a higher proportion of 'at-risk' patients were readmitted across all measured domains. In the multivariable analysis (n=97), the effect of smoking on readmission depended on cancer stage (interaction p=0.041). Among patients with advanced-stage cancer, current smokers had significantly higher odds of readmission compared to non-smokers (adjusted OR = 3.27; 95% CI: 1.02–10.52; p=0.047). This strong association was not found in patients with early-stage cancer. The multivariable model showed modest discrimination (AUC = 0.644).

Conclusion: In this exploratory, observational analysis at an academic safety-net hospital, current smoking was an independent predictor of 30-day unplanned readmission, but only among patients with advanced-stage lung cancer. This finding, while requiring validation in larger studies, highlights a critical opportunity for targeted smoking cessation interventions in this high-risk population to improve outcomes and reduce healthcare costs and utilization.

Category: Education / Clinical vignette

Persistent Breast Pain and Inflammation Leading to the Diagnosis of High-Grade Triple-Negative Breast Cancer in a Young Woman

Jean-Phillip Okhovat, Sandra Looby-Gordon

Case: A 36-year-old woman with a past medical history significant for anxiety and depression presented for evaluation of persistent right breast pain, redness, and swelling. She had initially been evaluated 12 days earlier for similar symptoms and was treated empirically with a five-day course of cefadroxil for presumed infectious mastitis. Despite completing antibiotics, her symptoms failed to improve, and she continued to report localized pain, erythema, and swelling without systemic symptoms such as fever, chills, or malaise.

Given the lack of response to antibiotics and persistent focal symptoms, further diagnostic evaluation was pursued. Breast imaging revealed a spiculated mass in the right breast at the 8:00 position, approximately 15 cm from the nipple, as well as an enlarged right axillary lymph node. Ultrasound-guided core needle biopsies of both the breast mass and axillary lymph node were performed.

Pathology demonstrated invasive ductal carcinoma of the right breast, high-grade (Histologic grade 3: architecture score 3, nuclear score 3, mitotic score 3), measuring 16 mm in greatest dimension in the sampled tissue. No associated ductal carcinoma in situ or lymphovascular invasion was identified. Immunohistochemistry showed the tumor to be estrogen receptor (ER) negative, progesterone receptor (PR) negative, and HER2 negative, with a markedly elevated proliferative index (Ki-67 approximately 95%), consistent with triple-negative breast cancer (TNBC). The right axillary lymph node biopsy confirmed metastatic high-grade ductal carcinoma with concordant receptor status.

The patient was formally diagnosed with ER-negative, PR-negative, HER2-negative invasive ductal carcinoma of the right breast with nodal involvement. She underwent multidisciplinary evaluation with breast surgery and medical oncology. Neoadjuvant chemotherapy and immunotherapy were initiated with pembrolizumab in combination with carboplatin and paclitaxel, followed by pembrolizumab with anthracycline-based therapy and subsequent pembrolizumab maintenance.

Following systemic therapy, the patient underwent a right modified radical mastectomy. Final surgical pathology demonstrated no residual in situ or invasive carcinoma in the breast and no metastatic disease in thirteen examined lymph nodes (0/13), consistent with a complete pathologic response. Residual cancer burden score was 0, and final pathologic staging was ypT0 pN0 per AJCC 8th edition criteria.

Discussion: This case highlights the importance of maintaining diagnostic vigilance when evaluating breast pain and inflammatory symptoms, particularly in young patients. While mastitis and other benign inflammatory conditions are common etiologies of breast pain, failure to respond to appropriate antibiotic therapy should prompt timely imaging and tissue diagnosis. Triple-negative breast cancer, especially when high-grade, may present with aggressive features and inflammatory mimics, contributing to potential diagnostic delay.

Early multidisciplinary involvement and adherence to guideline-directed neoadjuvant chemoimmunotherapy enabled this patient to achieve a complete pathologic response, which is associated with improved long-term outcomes in TNBC. This case underscores the need to avoid premature diagnostic anchoring, emphasizes the value of biopsy in refractory breast inflammation, and serves as a reminder that breast cancer can present atypically and at a young age, requiring a high index of suspicion to ensure prompt diagnosis and optimal treatment.

Category: Education / Clinical vignette

Transitioning from Methadone to Buprenorphine in a Hospitalized Patient with Torsades de Pointes

Sam Paltrow-Krulwich, MD, MPH; Kara Dillon, MD; Raymond Chung, MD1; Kathleen Neimann, NP; Marc LaRochelle, MD, MPH1; Alexander Walley MD, Msc

Learning Objectives

- Describe a successful case of inpatient transition from high-dose methadone to long-acting injectable buprenorphine utilizing low-dose buprenorphine induction and an oxycodone bridge.
- Facilitate complex methadone-to-buprenorphine transitions by distinguishing primary anxiety from opioid withdrawal-related anxiety
- Use supplemental sublingual buprenorphine to manage withdrawal in the stabilization period after initial long-acting buprenorphine administration.

Background: Numerous low dose buprenorphine induction protocols have been reported in case series to transition patients from methadone without a period of full-agonist cessation. However, the direct inpatient transition to long-acting injectable buprenorphine is not well described in the literature. Low-dose protocols advise continuing methadone during the induction. In patients with torsades de points-related arrythmia, providers will usually immediately discontinue of methadone. We present a case of a hospitalized patient with torsades de pointes who successfully transitioned from methadone to injectable buprenorphine via a low-dose sublingual buprenorphine induction and an oxycodone and hydromorphone bridge.

Case Description: A 70-year-old woman with opioid use disorder in sustained remission on methadone for 25 years was admitted to a community hospital for palpitations. She developed torsades de points-related sustained ventricular tachycardia followed by cardiac arrest requiring defibrillation. Her home medications included methadone 150mg daily and ondansetron, which were discontinued upon transfer to a tertiary care center.

Acknowledging substantial anxiety, the patient agreed to a low-dose buprenorphine induction but expressed significant anxiety about the transition. Upon methadone discontinuation, she was started on standing extended-release oxycodone 220mg three times daily (TID), oral hydromorphone as needed, and non-opioid comfort medications as needed to address withdrawal. On days 1-4, she received one 20mcg/hour buprenorphine 7-day patch added daily for a total of 80mcg/hour by day 4, which is approximately 2mg per day of buprenorphine. Between days 3-8 sublingual buprenorphine was uptitrated to 8mg TID. On day 9, extended-release oxycodone was discontinued and 300mg long-acting injectable buprenorphine was administered. Post-injection, her mild opioid withdrawal symptoms improved with ongoing sublingual buprenorphine TID and as needed hydromorphone. By day 14, sublingual buprenorphine had been uptitrated to 8mg four times daily plus 2mg four times daily as needed and hydromorphone was discontinued. Her transition was complicated by significant episodic anxiety responsive to frequent benzodiazepine dosing. She was discharged on day 18 with primary care follow-up to complete a benzodiazepine taper, wean supplemental sublingual buprenorphine, and continue long-acting injectable buprenorphine outpatient. At no point during the hospitalization was she sedated or intoxicated.

Conclusions: Four unique facilitators contributed to the success of this transition: 1) aggressive replacement of opioid agonism in the absence of methadone with both short and long-acting full agonists, 2) differentiation of primary anxiety from withdrawal, 3) an inpatient workflow to administer long-acting injectable buprenorphine and 4) the ongoing utilization of high doses of supplemental sublingual buprenorphine to control lingering withdrawal symptoms in the post-injection stabilization phase prior to reaching steady state.

Category: Education / Clinical Vignette

A Case of Multiple Myeloma Presenting as a Discrepancy in Vertebral and Hip T-Scores in a Postmenopausal Woman

Pella, Constantine MD, Malabanan, Alan MD

Learning objectives:

1. Recognize multiple myeloma as an important secondary cause of osteoporosis
2. Discuss a case of multiple myeloma presenting as severe vertebral osteoporosis
3. Identify a discrepancy between vertebral and hip T-scores as a possible indicator of underlying malignancy or secondary cause of osteoporosis

Background: The decision to pursue evaluation for secondary causes of osteoporosis is guided by the severity and pattern of bone mineral density loss, as well as clinical features suggestive of an underlying disorder. Among secondary etiologies, multiple myeloma is important to diagnose earlier on as early intervention leads to improved outcomes. However, some patients may present with non-classical signs or symptoms of disease or none. We present a case that may identify a potentially underrecognized clinical clue in the evaluation of osteoporosis: a significant discordance between vertebral and femoral neck bone mineral densometer measurements

Case: A 74-year-old woman from Haiti with a prior history of rectal cancer in remission presents to BMC endocrinology clinic. She was referred by her Primary Care Provider for evaluation of osteoporosis. She underwent Duel Energy X-Ray Absorptiometry in September 2021 which showed a T-Score of -2.49 of the femoral neck and a T-Score of -4.8 of the lumbar spine suggestive of severe vertebral osteoporosis. At the time she was started on alendronate however patient took only three doses before self-discontinuing due to patient reported side effects. Secondary work up was deferred because initial screening fore multiple myeloma or other secondary causes was negative (i.e lack of anemia, kidney injury, hypercalcemia, ect). Further bisphosphonate therapy was deferred due to previous reaction to alendronate. Calcium supplementation was deferred due to ongoing constipation. She was offered anabolic therapy however she declined treatment for osteoporosis at the time so her care was deferred to her PCP.

In June 2024, she presented to the emergency department for persistent back and leg pain. Computed tomography scan of the spine showed a new compression fracture of the L4 vertebrae. She was discharged from the ED with PCP follow up however represented to the ED two months later for worsening pain. Repeat CT scan of the spine showed worsening L4 compression fracture with new compression fractures in T11-L3 and L5 compared to imaging two months prior. Patient underwent bone marrow biopsy which confirmed kappa-restricted multiple myeloma. Patient began treatment for multiple myeloma and started on zolendronic acid for osteoporosis which was delayed for ~1 year due to delay in dental clearance.

Discussion: This case underscores the importance of evaluating secondary causes of osteoporosis, particularly when clinical findings are atypical. She lacked classic features of multiple myeloma (MM) such as hypercalcemia, anemia, renal impairment, or constitutional symptoms. However, a key indicator suggesting an alternative diagnosis may have been the marked discrepancy between her vertebral and femoral neck T-scores. While lumbar osteoporosis is common, MM often affects the axial skeleton, and significant differences between vertebral and femoral T-scores may signal underlying pathology.

Another challenge was the initial diagnostic workup, as the patient's serum protein electrophoresis (SPEP) was normal despite the presence of MM. This highlights the limitation of relying on SPEP alone, which has a sensitivity of about 80%. Definitive diagnosis was only achieved after further testing with immunofixation, free light chain analysis, and bone biopsy. These additional studies significantly improve diagnostic sensitivity and should be included when evaluating suspected secondary osteoporosis. Early recognition of such discrepancies and use of comprehensive testing may allow for earlier diagnosis and treatment of MM.

Category: Clinical vignette

Multisystem Inflammatory Disease with MAS/HLH in a Young Woman

Megi Resulaj

Background: Macrophage activation syndrome (MAS) and hemophagocytic lymphohistiocytosis (HLH) represent life-threatening hyperinflammatory syndromes often triggered by infections, cancers, or autoimmune diseases. Diagnosis remains challenging when classic features are absent.

Case Presentation: A 25-year-old woman with a history of ADHD, anxiety, and substance use (alcohol and marijuana) presented with complex visual and auditory hallucinations concerning for psychosis. Presentation was initially suspicious for alcohol withdrawal, and she required admission to the ICU for escalating phenobarbital doses and dexmedetomidine infusion. Neurology was consulted for psychosis and lower extremity paresthesias, with workup revealing an overall unremarkable MRI brain (except T2 FLAIR hyperintensities in bilateral medial temporal lobes), bland lumbar puncture, and normal EEG. CSF autoimmune encephalitis panel, meningitis panel, and cultures were also negative. EMG confirmed non-length dependent sensory polyneuropathy.

Transthoracic echocardiography performed for persistent sinus tachycardia outside of the withdrawal window revealed severely reduced ejection fraction (15-20%) with mid-left ventricular and apical akinesis, concerning for Takotsubo cardiomyopathy versus myocarditis. Right heart catheterization with endomyocardial biopsy was performed which showed focal chronic inflammation without myocyte necrosis. Immunohistochemistry for CD3 showed focal clusters of T cells and admixed CD163 positive histiocytes suggesting possible myocarditis.

Her course was complicated by persistent high-grade fevers (Tmax 104.7°F) and markedly elevated inflammatory markers. Initial concern for sepsis prompted infectious disease consultation and broad-spectrum antibiotics, though extensive workup including cultures and imaging failed to identify a source. Given lack of response to antimicrobials, rheumatology was consulted. Workup revealed positive ANA at 1:80 (speckled pattern), positive dsDNA antibody at 1:10, and positive anti-SSA antibody. MAS/HLH was suspected given the clinical picture of multisystem inflammation without a clear infectious etiology, along with progressive elevation of CRP and ferritin despite normalized ESR. HScore 172 points (threshold ≥169 corresponds to 100% sensitivity and 94.1% specificity). Treatment with anakinra was initiated on 4/7/26 and escalated to twice-daily dosing for persistent fevers and tachycardia, combined with high-dose corticosteroids.

Clinical Course and Diagnostic Considerations: The patient demonstrated clinical improvement with downtrending CRP and ferritin, resolution of fevers, and echocardiographic improvement in cardiomyopathy after starting anakinra therapy. She was transitioned from IV methylprednisolone to PO prednisone and started on DMARD therapy with cyclosporine and hydroxychloroquine.

The underlying trigger for MAS/HLH remained uncertain. While the fever pattern was atypical for adult-onset Still's disease (AOSD), the patient did at one point demonstrate a characteristic salmon-colored rash. Conversely, the combination of positive ANA, dsDNA Ab, anti-SSA Ab, and psychosis in a young female raises suspicion for systemic lupus erythematosus (SLE). Psychosis, myocarditis, and neuropathy can occur in both AOSD and SLE, further complicating diagnosis.

Conclusion: This case illustrates the diagnostic complexity of MAS/HLH when presenting with multisystem involvement including severe cardiomyopathy, neuropsychiatric manifestations, and hemodynamic instability. Prompt initiation of IL-1 blockade with anakinra and corticosteroids led to clinical and biochemical improvement. Ongoing clinical observation and serologic evaluation will be critical in determining whether AOSD or SLE represents the underlying trigger for this life-threatening hyperinflammatory syndrome.

Category: Clinical research

Prospective Evaluation of an Echocardiography-Based Artificial Intelligence Model for Detecting Transthyretin Cardiac Amyloidosis: Results from the SCAN-MP Study

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Background: Transthyretin cardiac amyloidosis (ATTR-CM) is an under recognized cause of heart failure (HF), frequently difficult to distinguish from other etiologies. A previously developed deep learning model using apical 4-chamber echocardiogram clips showed high accuracy in retrospective datasets with a high prevalence of disease (Slivnick 2025). We assessed the accuracy of this AI model in a prospective cohort screened for ATTR-CM.

Methods: We utilized a fully automated deep learning model that was developed and validated to detect any type of cardiac amyloidosis from a single apical 4-chamber TTE video utilizing a 3D convolutional neural network. We tested the AI model using a prospective multi-center cohort of 534 Black and Hispanic patients >60 with HF enrolled in SCAN-MP (Ruberg et al 2023). All underwent baseline TTE, Tc-PyP imaging, and TTR genotyping. Model output was categorized using a Youden index threshold of 0.05.

Results: Among 534 participants, 43 (8%) had ATTR-CM by Tc-PyP. The model achieved sensitivity 76.7%, specificity 89.2%, PPV 38.4%, NPV 97.8%, and AUC 87.7%. There was no significant difference in ejection fraction, wall thickness or global longitudinal strain between True Positives (n=33) and False Negative (n=10) patients.

Conclusion: In a low-prevalence cohort, the AI model showed high NPV, supporting its role in ruling out ATTR-CM and identifying a high-risk cohort in whom further testing with scintigraphy would have a high yield.

Category: Education / Clinical vignette

The Critical Juncture: A Complicated Case of Hypermagnesemia

Satishchandra, Divya

Learning Objectives

1. Recognize junctional bradycardia on electrocardiogram (ECG).
2. Identify risk factors for development of hypermagnesemia with particular emphasis on laxative use in geriatric population.
3. Describe management of unstable junctional bradycardia secondary to hypermagnesiemia.

Case Description: A 90 year old female with a past medical history of hypertension, asymmetric septal hypertrophy and obesity presented to the hospital with two weeks of dyspnea at rest and with exertion. She was noted to be tachypneic, and her labs were notable for baseline renal function and mildly elevated brain natriuretic peptide (BNP) of 392 pg/mL. Her chest x-ray revealed bibasilar opacification, and point-of-care ultrasound showed diffuse b-lines. Her ECG showed normal sinus rhythm with right bundle branch block. She was subsequently admitted to the Geriatrics Service for volume overload in the setting of newly diagnosed heart failure with preserved ejection fraction (HFpEF).

During her initial hospital course, she was diuresed with furosemide and subsequently developed acute kidney injury resulting in Cr rise from 1.2 mg/dL to 2.7 mg/dL, for which the etiology was thought to be contrast-related or over-diuresis. Of note, she also experienced severe constipation during the hospitalization, requiring escalating catharsis agents including miralax, senna, bisacodyl suppositories, and finally, tap water enema, the latter with modest effect. On hospital day 7, she was noted to have intermittent bradycardia with HR 40 bpm, and her magnesium level was found to be 4 mg/dL. Overnight, she became persistently bradycardic, with ECG showing junctional bradycardia with HR 30 bpm. Initially, she was hemodynamically stable; however, she became less responsive and hypotensive, prompting initiation of epinephrine drip and transfer to the intensive care unit. During this time, repeat laboratory workup showed worsening Cr 3.1 mg/dL as well as Mg 5.7 mg/dL, which was likely the cause of her junctional arrhythmia. She was given additional furosemide and calcium gluconate to lower the magnesium and stabilize the cardiac membrane. She was soon weaned off epinephrine with improvement in magnesium levels. Renal was consulted, and though renal replacement was discussed, it was deferred given her clinical improvement. Her renal function returned to baseline, and she was subsequently discharged in stable condition with strict guidance to avoid magnesium containing products. In the past, she had used fleet enemas to manage constipation, and these were strictly advised against.

Discussion: This case illustrates the electrophysiologic consequences of electrolyte derangements that can occur as a result of renal injury. In our case, renal injury lead to the development of hypermagnesiemia, which precipitated an unstable, junctional bradycardia. Early in chronic kidney disease, hypomagnesium is a very common electrolyte derangement. However, with more advanced renal disease, there is reduced glomerular filtration, which is not overcome by compensatory mechanisms, leading to hypermagnesemia (1).

There have been several case reports of junctional bradycardia observed with hypermagnesemia (2) (3). Stabilization measures include increased chronotropy with agents such as epinephrine or dopamine. Loop diuretics and calcium gluconate help acutely correct the elevated serum magnesium levels and protect the cardiac membrane. In cases where magnesium levels do not respond, hemodialysis may be considered (4).

Another important association is magnesium-containing laxative use and enemas, particularly fleet enemas. These agents lead to excess magnesium stores in the gut, which are continuously absorbed and lead to elevated bloodstream levels—in the presence *and absence* of renal injury(3). Though our patient had not received fleet enemas while admitted, she had been using them outside the hospital. In the geriatric population, this association is of important clinical significance because constipation and escalation of catharsis agents is very common.

Citations

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Category: Clinical research

Acquired Factor X Deficiency in Systemic AL Amyloidosis: Activity Response after Hematologic Treatment

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Introduction: Acquired factor X (aFX) deficiency is a rare complication of amyloid light-chain (AL) amyloidosis associated with increased bleeding risk. Data on its prevalence and treatment response to novel agents remain limited.

Methods: We retrospectively analyzed 88 patients with AL amyloidosis and FX activity ≤50% evaluated at the Boston University Amyloidosis Center (2000–2023), focusing on clinical features, treatments, and outcomes.

Results: Out of 1956 patients with AL Amyloidosis, aFX deficiency was confirmed in 88 patients (4.4%), with a median FX activity of 39% (range, 5–50%). 14 (16%) patients had severe (≤20%) aFX deficiency, and forty patients (45%) were asymptomatic. Severe deficiency often presented with cutaneous or post-procedural bleeding and correlated with younger age, hepatic involvement, multi-organ disease, and lower dFLC levels. Among 28 patients with serial FX measurements after treatment, FX activity improved to >50% in 75% of the patients, who had a median overall survival was 73 months (95% CI, 55-91). FX activity increased from baseline by a median of 28% after high-dose melphalan followed by autologous stem cell transplantation (HDM/SCT, n=10) compared to 14% after non-SCT treatment regimens (n=18) (p=0.337). Among ten patients who underwent HDM/SCT, four patients experienced hemorrhagic complications within the first month of treatment (grade 1, n=1; grade 3, n=3). Complete hematologic response (hemCR) was associated with greater FX improvement (42% vs. 14%, p=0.027).

Conclusion: aFX deficiency is rare in AL Amyloidosis and its severity is associated with younger age, liver and systemic organ involvement. FX activity improves with treatment and FX activity increase positively correlates with depth of hematologic response. HDM/SCT is efficient and leads to high rates of FX improvement but carries a high risk of hemorrhagic complications requiring optimal preventive and supportive therapeutic strategies.

Category: Education / Clinical vignette

Navigating the Abyss: Unraveling Nondiabetic Hypoglycemia in Hepatocellular Carcinoma

Kevin Tong, Ricardo Cruz

LEARNING OBJECTIVES:

1. Diagnose symptomatic hypoglycemia using Whipple's triad.
2. Recognize the workup and differential of nondiabetic hypoglycemia.

CASE: A 30-year-old male with history of hepatitis B and recent diagnosis of hepatocellular carcinoma presented with abdominal pain and distention, nausea, and hypoglycemia with fingerstick glucose of 39 mg/dL.

He denied other symptoms such as vomiting, diarrhea, dysuria, chest pain, or leg swelling. He was afebrile and tachycardic to 100s. Physical exam was notable for mild lethargy, firm upper abdomen, moderate abdominal distention with fluid wave, and diffuse abdominal tenderness. There was no asterixis or jaundice. Labs were significant for WBC 12.5, Hgb 7.5, AST 185, ALT 23, albumin 1.8, and glucose 101 after giving IV dextrose. Abdominal ultrasound showed moderate ascites.

Given nondiabetic hypoglycemia, a dextrose infusion was initiated. This resolved the nausea and lethargy. The infusion was discontinued and when glucose was <55 mg/dL, a nondiabetic hypoglycemia workup was initiated. Insulin, proinsulin, C-peptide, IGF-1, IGF-2, beta-hydroxybutyrate, insulin antibody, cortisol, and sulfonylurea hypoglycemia panel were collected. The hypoglycemia labs were notable for suppressed C-peptide, low proinsulin, and an elevated IGF-2 to IGF-1 ratio. Based on this, the patient was ultimately diagnosed with IGF-2-induced hypoglycemia related to his hepatocellular carcinoma.

DISCUSSION: Nondiabetic hypoglycemia is a rare cause of low blood glucose; most hypoglycemia cases occur from exogenous insulin. Clinical suspicion of symptomatic hypoglycemia should be high when Whipple's triad is fulfilled, which includes symptoms of hypoglycemia such as diaphoresis, anxiety, lethargy, palpitations, hunger, and seizure, low plasma glucose concentration (<55 mg/dL), and resolution of symptoms after plasma glucose concentration is raised. The patient fulfilled this with adrenergic and neuroglycopenic symptoms of hypoglycemia, low plasma glucose, and symptom resolution with dextrose.

Nondiabetic hypoglycemia is divided into insulin-mediated and insulin-independent causes. Insulin-mediated causes include insulinoma, islet cell hyperplasia, and iatrogenic hyperinsulinism. Insulin-independent causes are broader; non-exhaustively this includes alcohol, liver failure, sepsis, adrenal insufficiency, medication/drug side effects, and paraneoplastic processes. Often, clinical history can reveal the cause by assessing for comorbidities. However, when etiology is unknown, as in this case, supervised testing can determine the underlying disorder.

CONCLUSION: Nondiabetic hypoglycemia is a rare cause of low blood sugar; it is important to recognize symptomatic hypoglycemia using Whipple's triad to initiate the proper workup. While clinical history can often reveal the cause of hypoglycemia, clinicians should be aware of the broad workup for diagnosing the underlying etiology of nondiabetic hypoglycemia. This case highlights an example of recognizing nondiabetic hypoglycemia using Whipple's triad and then executing its workup.

Category: Clinical research

Neuroimaging in Veterans with Irritable Bowel Syndrome (IBS): Analysis of the TRACTS (Translational Research Center for Traumatic Brain Injury and Stress Disorders) Longitudinal Prospective Cohort Study

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Introduction: IBS is a highly prevalent disorder of gut-brain interaction that is frequently comorbid with PTSD. Prior studies in non-veterans with IBS suggest that the brain areas involved are associated with pain or emotional processing and visceral sensation, but studies in the veteran population are lacking. This study aims to identify structural and functional brain changes in veterans with IBS, with or without PTSD, to gain insight into the pathophysiology of IBS.

Methods: This study includes veterans enrolled in TRACTS, where participants undergo neuropsychiatric assessments and neuroimaging with MRI. Of 707 participants, 59 were screened in for IBS through review of the electronic health record based on Rome IV criteria. Exclusion criteria included inflammatory bowel disease, microscopic colitis, diverticulitis, prior colonic surgery, and incomplete baseline data. Functional connectivity was modeled using a seed-based correlation approach focused on eight components of the default mode network (DMN). Linear regression controlling for PTSD was used to estimate the effect of IBS on various brain regions. Data processing of major MRI sequences was used to measure morphometric properties of cortical and subcortical gray matter to obtain structural characteristics. Two-sample T tests were used to generate pairwise comparisons between groups. $P<0.05$ was considered significant.

Results: This is the first structural and functional neuroimaging study in a large veteran population with IBS and PTSD. Demographic characteristics are shown in Table 1. When controlling for PTSD, functional MRI showed higher connectivity between the cingulate and the bitemporal components of the DMN associated with IBS (Table 2). The DMN plays a key role in self-referential processing and emotional regulation. These results contrast with prior functional studies which showed reduced temporal lobe activation and resting-state functional connectivity in the DMN in IBS. Structural data showed differences between participants with IBS and those with PTSD only. The structural findings were distinct from the areas noted to have increased functional connectivity in IBS.

Conclusion: In this exploratory study, there were unique brain differences seen in veterans with IBS compared with controls and those with PTSD, suggesting distinct brain pathomechanisms for IBS and PTSD. These findings add novel insights into the pathophysiological differences of brain regions involved in IBS and PTSD.

Category: Education / Quality improvement

Implementation of a Syringe Prescribing Guide and Orderset for Prescribers and People Who Inject Drugs

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Background: Access to sterile syringes for people who inject drugs (PWID) is essential for reducing HIV, hepatitis B and C, and skin and soft tissue infections which can result from sharing or reusing syringes. Sending prescriptions to pharmacies can improve access, but may be difficult for prescribers to navigate and remains underutilized.

Objective: Create and implement a syringe prescribing guide to facilitate syringe prescribing for PWID.

Methods: To better identify barriers to syringe prescribing, we collaborated with harm reductionists at two syringe service programs, pharmacists, and addiction medicine prescribers to create a double-sided Syringe Prescribing Guide. The front side aims to facilitate patient-prescriber conversations and includes a visual menu of syringe types with specifications (gauge, barrel, needle length) and street names familiar to PWID. The back side directs prescribers to the companion electronic medical record (EMR) orderset, provides guidance on determining syringe quantity, and describes additional supplies recommended for safer injection practices (e.g., alcohol swabs, sterile water) that may not be available at a typical retail pharmacy. The Syringe Prescribing Guide was distributed to prescribers in Addiction Medicine, Internal Medicine, Family Medicine, and Emergency Medicine. We ran an EMR report on the frequency of prescriptions sent via the orderset and distributed a satisfaction survey to a convenience sample of prescribers (approximately 290).

Results: Between February 2025 and January 2026, the orderset was used by 47 unique prescribers in 83 patient encounters to generate 142 orders. These included 78 (54.9%) prescriptions for syringes, 40 (28.2%) prescriptions for alcohol swabs, and 24 (16.9%) prescriptions for naloxone. Of the 78 syringe prescriptions, 62 (79.5%) were associated with substance use diagnoses and 16 (20.5%) with other diagnoses (e.g., diabetes, hypogonadism). A minimum of 22 patients (28.2%) filled at least one syringe prescription (complete pharmacy data was not available). Among 25 prescriber survey respondents, 13 were familiar with the syringe prescribing guide. Among these 13 prescribers, 4 (30.8%) sent a prescription for syringes and 7 (53.8%) reported increased likelihood of future syringe prescribing.

Conclusions: Syringe prescribing guides can increase awareness of syringe prescribing as a tool for harm reduction and facilitate conversations with patients about syringe access and safer injection practices. Pairing with an EMR orderset can reduce barriers for prescribers.

Acknowledgements: Karri Weisenthal, MD; Marielle Baldwin, MD, MPH; Jane Doan, RPh; Je Lee, RPh; Sarah Mackin, MPH