**Gender differences in sexual and reproductive health seeking patterns among Arabs: analysis of Telehealth data**

**Background:**
Few publications addressed the effect of gender on help-seeking behavior related to Sexual and Reproductive Health (SRH) in the Arab region. This project aims to investigate and understand the difference between males and females in their SRH seeking behaviors using telehealth.

This is a cross-sectional analysis of users that used the telehealth service between January and September 2019 and are currently living in Saudi Arabia, Egypt, and Jordan.

**Methods:**
Gender (as a binary variable) was examined using a logistic regression model. A multinomial logistic regression model was used to compare SRH topics among gender groups. Topics analyzed were:
1. Issues relating to sex organs
2. Infertility
3. Sexually transmitted diseases (STDs)
4. Sexual health education and counseling

**Results:**
There was no statistically significant difference between gender groups with respect to the probability of using the service when adjusted for age, country, marital status, and having other comorbidities (OR: 0.99, 95% CI: 0.94 – 1.05, p-value: 0.81). Females were more likely to seek help for issues related to fertility (OR: 5.47, 95% CI: 3.57 – 8.00, p-value < 0.001), and are less likely to request sexual education and counselling (OR: 0.78, 95% CI: 0.68 – 0.88, p-value < 0.001), and consult about STDs (OR: 0.71, 95% CI: 0.52 – 0.97, p-value: 0.029), than “Issues relating to sex organs” (the reference category) compared to men, after adjusting for confounders.

**Conclusions:**
Findings suggest that while there is no association between gender and the frequency of utilizing telehealth services to consult about SRH related issues, both genders use the service to address different concerns.

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**Patient Attitudes about Health-Related Quality of Life and Depression in an Ambulatory Heart Failure Clinic**

**Background:**
Improving health-related quality of life (HRQL) is an important goal of therapy for heart failure (HF) management. Depression decreases HRQL and has significant prevalence in the HF population. Little is known about patient attitudes regarding assessment of HRQL and depression in an ambulatory setting. The objectives of this study were to understand HF patient preferences regarding discussion of HRQL and its determinants in the ambulatory HF clinic.

**Methods:**
179 Ambulatory HF patients completed Visual Analog Scales (VAS) to assess HRQL, the Minnesota Living with Heart Failure questionnaire (MLHF), the Patient Health Questionnaire-9 (PHQ-9), the Time Trade-Off (TTO) questionnaire, and answered HRQL patient attitude statements.

**Results:**
- 97% identified improving HRQL as the most important goal of therapy and 93% would be willing to complete a 5-minute survey about HRQL before clinic visit.
- Depressed patients had lower HRQL compared to non-depressed patients. Of depressed patients, 95% would want to know if they were depressed, 77% would be interested in counseling and 88% would be interested in pharmacological treatment. HF patients with lower MLHF scores had higher TTO scores ($\rho_s = 0.465$, $P < 0.01$).

**Conclusions:**
A large majority of ambulatory patients with HF prioritizes improving HRQL. Patients who prefer to spend more clinic time on HRQL improvement have worse HRQL. Depressed patients who prioritize HRQL improvement have worse HRQL compared to non-depressed patients who prioritize HRQL improvement. Most depressed patients want to know if they are depressed, but not all would want treatment.
### Association between % obesity and per capita density of fast-food restaurants at the county level in United States in 2010

**Title:** Association between % obesity and per capita density of fast-food restaurants at the county level in United States in 2010  
**Authors:** Victor Paul Bagwell  
**Objective:** Obesity in the United States is increasing and linked to increased medical spending, and negative health outcomes. The number of fast food restaurants is increasing. Not eating at home is linked to consuming more calories, and increased calorie consumption is linked to increased obesity. The existing knowledge about the relationship between obesity and fast food consumption is conflicting. This study investigated the association between the percent obese and the number of fast food restaurants per 1,000 people by county.

**Methods:** An ecological study was conducted with cross-sectional analysis of the data for 2010 using regression. Publicly available data from diverse and complex data sources were aggregated into a single dataset representing 3,148 United States Counties for the year 2010. The crude analysis evaluated the primary exposure (# of fast food restaurants per 1,000 people) and the outcome (% obese) variables. The multivariate analysis adjusted for 35 covariates.

**Results:** The crude analysis showed a statistically significant negative association between % obese and the # of fast food restaurants per 1,000 people with coefficient = -3.00, 95% CI(-3.46, -2.53), p-value = < 0.0001. When outliers were removed, the crude analysis also showed a statistically significant negative association with coefficient = -3.47, 95% CI(-4.01, -2.94), p-value = < 0.0001. The multivariate analysis and adjusting for 35 covariates showed a negative relationship, but was not significant with coefficient = -0.34, 95% CI(-0.92,0.25), p-value = < 0.264.

**Conclusions:** No association was found between percent obese and the number of fast food restaurants per 1,000 people when adjusting for covariates. Additional research is needed.

### Epidemiology of Gastric and Colorectal Signet Ring Cell Adenocarcinomas

**Background:** Signet ring cell adenocarcinomas (SRCCs) are a rare form of poorly detected aggressive adenocarcinomas, and are correlated to autosomal dominant mutations. Gastric SRCC patients are at increased risk of lobular breast cancer. Other secondary cancer risks are suspected. The overall epidemiology of SRCCs is poorly defined, and a better understanding of their profiles may lead to tailored screening schedules for genetically predisposed patients.

**Methods:** Retrospective cohort study using the Surveillance, Epidemiology and End Results (SEER)-18 Program from 1975-2016, for diagnoses after 1992, following SRCC histology definition formalization in 1990. For patients with gastric and colorectal SRCCs compared to corresponding conventional adenocarcinomas, mortality is determined via time-to-event analysis, and odds ratios for secondary cancers are estimated using multiple logistic regression.

**Results:** Gastric and colorectal cancers comprise 1.8% and 11% of all solid cancers, whereas their corresponding SRCCs comprise 57% and 22% of total SRCCs, respectively. Age of onset is seven years earlier for SRCC patients. Compared to conventional adenocarcinomas, hazards ratios for mortality are 1.11 (95% CI: 1.09-1.14) for gastric SRCCs and 1.54 (95% CI: 1.47-1.59) for colorectal SRCCs, after adjusting for age, gender, race, detection stage, grade differentiation, and surgery and chemotherapy. Age- and sex-adjusted odds ratios for any secondary signet cancers, primarily of gastrointestinal origin, are 3.50 (95% CI: 2.26-5.41) and 6.92 (95% CI: 4.84-9.89), respectively.

**Conclusions:** SRCC patients have worse prognosis and are at increased risk for secondary SRCC malignancies. They may benefit from additional high-risk cancer screening protocols, particularly for gastrointestinal tract malignancies.
Telestroke in Brazil: Comparing the implementation of services across the country

Background: Stroke is the second leading cause of death and disability in Brazil. Telestroke is a growing practice model that provides fast and capable remote access to specialists. Policy disagreements and lack of a centralized supervising organ resulted in the heterogeneous implementation of telemedicine programs. Thus, there is limited knowledge readily available on the adoption or success of telestroke programs in the country. Identifying these programs and comparing their structure and services is a crucial step to understand their challenges and characterize the status of telestroke in Brazil.

Methods: We designed a cross-sectional study to compare telestroke programs among the five geopolitical regions of Brazil (North, Northeast, Southeast, South and Midwest). We performed comprehensive online searches to identify potential telestroke services that can answer a provider-level survey about the structural and functional components of their programs. Different regression models will compare the number of telestroke services and program features by geopolitical region, by telestroke role (hub-spoke), by hospital location (urban-rural), and by institution type (private-public). Data collected from national databases on demographic information, socioeconomic determinants, and stroke epidemiology will compose adjusted analyses for multivariable regression models.

Results: Data collection via provider survey was affected by the COVID19 pandemic, so results are pending.

Conclusions: Identifying program distribution and comparing their structures, services, and challenges are essential steps to understanding the current status of telestroke in Brazil. Once finished, we anticipate that our data should provide valuable evidence-based knowledge to practitioners and policymakers, facilitating a systematized implementation of a telestroke network.

Characterization of AJCC 8 T2 and T3 Cutaneous Squamous Cell Carcinomas

Background: Cutaneous squamous cell carcinoma (CSCC) is the second most common cutaneous neoplasm. The current staging system in the US is the AJCC8. In multiple analyses of poor outcomes, there is minimal to no difference between T2 and T3.6 This lack of prognostic differentiation between T2 and T3 tumors is a critical weakness of AJCC8.

Methods: This is a retrospective cohort analysis. Univariable analyses identified risk factors associated with poor outcomes. Cumulative incidence function curves compared the current AJCC8 model with proposed models. Model performance was evaluated statistically with Akaike’s Information Criterion (AIC) and Bayesian Information Criterion (BIC).

Results: Poor differentiation (PD) was associated with a significantly increased sub-hazard ratio for all outcomes of interest. A proposed staging system with the addition of PD and number of high-risk factors significantly separated T2 and T3 tumor stages, in addition to outperforming based on AIC/BIC, homogeneity (lower poor outcome proportion in T1/T2) and monotonicity (higher poor outcome proportion in T2/T3).

Conclusions: The addition of PD and number of high-risk factors allows for differentiation of current AJCC8 T2 and T3 tumors, and allows for a lower risk T2 group and a higher risk T3 group.
Tele-Stroke usage by patients with stroke symptoms in New England area hospitals with Tele-Stroke facility.

Background: Stroke is one of the major health issues with 800,000 Americans have a stroke annually becoming the largest cause of chronic disability. The most common form is the ischemic (closed vessel) stroke and the most promising treatment available to the patients is the clot-busting drug, tissue plasminogen activator (tPA). Unfortunately, tPA has to be given to the patient within three hours of the stroke onset and Tele-Stroke is helping bridge this gap by allowing any health center to access expert stroke neurologists and provide advanced stroke care through Tele-Stroke facility.

Methods: A cross-sectional study where patient data with stroke symptoms was taken from Tele-stroke participating hospitals in Massachusetts, Maine, Rhode Island and New Hampshire. The primary outcome being usage of Tele-stroke facility and the primary exposure being patients with stroke symptoms (who may or may not have stroke). Logistic regression as outcome is binary. Chi-square tests done to compare demographics.

Results: Results explain a significant increase in tele-stroke usage with an increase in age. 71-80 age adults are more likely (Odds Ratio=0.3416, CI = 0.0457-0.63763) to use Tele-Stroke usage than minors. 80+ age adults are more likely (Odds Ratio=0.4384, CI = 0.1441-0.7326) to use Tele-Stroke usage than minors. Around 40% patients with hypertension have used tele-stroke facility. Similarly, around 20% patients of stroke/Transient ischemic attack/VBI have contributed in Tele-Stroke usage. The least important diseases in Tele-Stroke usage are dementia, valve prosthesis, seizures and others.

Conclusions: Tele-Stroke facility usage by 71 to 80 old age patients are 0.341 units more likely than minors and 80+ age patients are 0.438 units more likely than minors. Hypertension and stroke history are prominent diseases having high contribution in Tele-Stroke usage.

Validity of Self-reported versus CMS-identified Atrial Fibrillation in the VITAL Study

BACKGROUND: In cohort studies, atrial fibrillation (AF) is frequently ascertained by either using claims data from the Centers for Medicare and Medicaid Services (CMS) or through participant self-report.

OBJECTIVE: To compare the yield and accuracy of AF diagnoses ascertained by self-report versus CMS linkage.

METHODS: The Vital Rhythm Study, a randomized trial testing vitamin D and omega-3 fatty acid supplementation in the primary prevention of AF among 25,131 individuals without preexisting cardiovascular disease or cancer, has utilized a combination of participant self-report on annual questionnaires and linkage to CMS claims to ascertain AF diagnoses. Medical records are then reviewed by an endpoint committee of cardiologists to confirm or disconfirm incident AF events. The yield and positive predictive value (PPV) of these two methods of AF ascertainment were compared among 15,436 participants who were age 65 or older.

RESULTS: Over 4.35 years of follow-up, a total of 675 participants self-reported AF and 817 had an AF diagnosis in CMS claims data. Medical records were obtained on 654 AF diagnoses that were self-reported (522, 77%) or identified by CMS linkage (467, 57%) and reviewed by the endpoint committee. Of the AF diagnoses where records were obtained, 548 cases of incident AF were confirmed (84%) by medical record review. Of these confirmed events, 490 (89%) were self-reported by participants and 393 (71%) had an AF diagnosis in CMS claims data. The PPV (confirmed/ascertained events) for confirmed AF by medical record review was 94% (490/522) for self-report, 84% (393/467) for CMS linkage, and 97% (344/355) for AF events identified by both sources.

CONCLUSION: The yield and accuracy of AF diagnoses identified by self-report was higher than those identified through CMS linkage. A significant proportion of confirmed incident AF cases were not identified by CMS linkage (29%) and ascertainment was optimized when both methods were utilized. When AF events were both self-reported and identified via CMS linkage, the PPV was very high.
**Practicum Project Abstracts 2020**

**Do Canadian Adults with Celiac Disease Need Supplements to Meet RDA Targets?**

**Background:**
Concerns exist regarding nutritional deficiencies and risk of metabolic syndrome in patients with celiac disease (CeD) on a gluten-free diet (GFD). This study assessed if patients with CeD following a GFD meet Recommended Dietary Allowance (RDA) targets for macro- and micronutrients and the effect of supplement use in reaching RDA targets.

**Methods:**
Adults with biopsy confirmed CeD were recruited within 6 weeks of starting a GFD. Participants prospectively completed a 3-day food record, including dietary supplement use, at 6, 12, and 24 months after study entry. Macro- and micronutrient consumption was determined using the Cronometer Community database. RDA targets were analyzed using chi-square test and multivariable logistic regression to determine the effect of supplement use.

**Results:**
137 (66% female; mean age 44 years) completed interpretable food records. 33% used supplements at any time point, with no significant difference in use among gender or age. > 85% met the RDA for carbohydrates and protein, while 59% met the target for fibre. Omega-6 remained consistently below target despite supplementation. B vitamins, Vitamin D, and calcium required supplement use to meet targets. < 55% met the RDA folate target and < 50% for Vitamin E, despite supplement use. A multivitamin was adequate to meet RDA targets, except for calcium.

**Conclusion:**
Adults with celiac disease met RDA targets for protein and carbohydrate; folate, fiber, and Vitamin E were below target at all time points, even with supplementation. Those taking a calcium supplement were more significantly more likely to meet RDA target, while a multivitamin was generally sufficient to meet micronutrient RDA targets.

**Surgical approach and unplanned readmission following pelvic organ prolapse surgery: A retrospective cohort study using data from the National Surgical Quality Improvement Program Database (NSQIP)**

**Background:**
Temporal trends in surgery for correction of pelvic organ prolapse (POP) have shown a shift toward more laparoscopy, and a decreasing proportion of vaginal and abdominal surgeries. In order to inform potential interventions to improve post-operative care, we aimed to define the reasons and timing of hospital readmissions following surgery for POP by surgical approach.

**Methods:**
Patients undergoing surgery for POP between 2012 and 2017 were identified in the American College of Surgeons National Surgical Quality Improvement Program database. Hazard risks of readmission by surgical approach (vaginal, laparoscopic, abdominal, or combined) were determined by multivariable cox regression. Diagnoses and timing of readmission by surgical approach were examined.

**Results:**
Of 46,518 women undergoing surgery for POP during the study period, 900 (1.9%) were readmitted to hospital within 30 days post-operatively. After adjusting for prespecified potential confounders, laparoscopic and abdominal surgical approaches were associated with higher risks of readmission relative to a vaginal approach (aHR 1.30, 95% CI 1.05-1.60, and 2.02, 95% CI 1.44-2.82, respectively). The most common reason for readmission was surgical site infection among women undergoing vaginal surgery (16.0%), and gastrointestinal causes among those undergoing laparoscopic (31.8%) or abdominal surgery (29.7%). The most common readmission diagnosis was gastrointestinal issues (29.8%) for women admitted within 7 days of surgery and surgical site (19.9%) for women readmitted 8 to 30 days post-operatively.

**Conclusion:**
Women undergoing laparoscopic or abdominal surgery for POP were at higher risk of readmission relative to those undergoing surgery via a vaginal approach. The reasons and timing of readmission differed based on surgical approach.
Ownership and Usage of Insecticide Treated Nets Among Recently Pregnant Women in Rwanda: Does Routine Distribution Ensure Coverage?

Insecticide treated net (ITN) use in pregnancy has shown to have substantial benefits to women and their babies in areas of moderate to high transmission in Africa [1]. ITNs are currently distributed through mass distribution campaigns as well as routine services in Rwanda [2]. In 2009 there was a resurgence of malaria in Rwanda that has been attributed to a decrease in net coverage [3].

The objective of this study is to examine the association between routine distribution of ITNs to pregnant women and women with small children and their odds of owning and using them. This is a cross-sectional study of women who were pregnant in the year prior to the 2014-2015 DHS survey and the facilities mapped nearest to their community cluster. We examined the association between routine distribution of ITNs, age, education, malaria endemicity, wealth index, urban or rural setting, mass distribution, and women’s ITN ownership. We conducted a secondary analysis on the exposure of interest and covariates’ association with bed net use the previous night.

We found that routine distribution at the nearest facility significantly increased a recently pregnant woman’s odds of owning a bed net. Routine distribution was not associated with increased use of the bed net. Although routine distribution was associated with increased net ownership, substantial increase in routine distribution would be required to ensure universal coverage of pregnant women and women with small children.

Survival outcomes for US and Canadian patients diagnosed with Hodgkin Lymphoma before and after Brentuximab Vedotin approval for relapsed/refractory disease: a retrospective cohort study

Background: Insurance impacts survival for cancer patients. Universal healthcare provides broad coverage though funding is delayed for financial evaluations. We compared overall survival(OS) for US and Canadian patients diagnosed with Hodgkin lymphoma(HL) pre/post FDA approval of Brentuximab Vedotin(BV) for post-transplant relapse, given three-year Canadian delays. 20% of patients are refractory/relapse, proceed to transplant; 50% then relapse requiring therapy.

Methods: Patients 16-64 years diagnosed with HL in 2007-2010(period 1), 2011-2014(period 2) in the US SEER and Canadian Cancer Registries were included. A surrogacy access date was used as neither dataset captures chemotherapy. Exclusion criteria: missing histology, follow-up or insurance; post-mortem diagnosis. Log-rank and Kaplan-Meier analysis compared OS in period 2 vs. 1 by insurance including Canadian/universal. Adjustment utilized Cox proportional hazards.

Results: 12003 US and 4210 Canadian patients were included with similar demographics except shorter Canadian follow up(censored December 2014). US patients demonstrated improved survival (crude HR 0.90(95%CI 0.80-1.02), adjusted 0.80(95%CI 0.71-0.91)), between periods. Improvement for Canadians lost significance with adjustment (crude HR 0.72(95%CI 0.54-0.95), adjusted 0.77(95%CI 0.59-1.02)). 36-month OS was worse for uninsured and Medicaid vs. universal patients. Interestingly, period 2 survival significantly improved for Medicaid(+7.4%), but worsened for uninsured(-4.1%). Privately insured patients demonstrated stable OS between periods, but globally improved (p=0.044) vs. universal.

Conclusions: Survival was worse for Medicaid/uninsured compared to privately/universally insured patients. All had stable or improved survival in period 2 except uninsured patients. No difference in change between periods for privately or universally insured occurred from delayed access. Robust datasets capturing chemotherapy and comorbidities are needed.
**Association between years of residency in the USA of Hispanic immigrant women and small for gestational age**

Maternal and fetal factors have been associated with small for gestational age offspring (SGA), a risk for cardiometabolic disease in adulthood. Acculturation in US Latino population has been correlated with negative effects on health and the perinatal period is not immune to the effects. We hypothesized that highly acculturated Hispanic pregnant women have higher risk of SGA.

Retrospective study from PeriBank (2011-2019) participants born in Latin American countries. Acculturation measured with length of stay in the US (LOS) 0-3, 4-6 and > 6 years. SGA defined as birth weight for gestational age below the 10th percentile. Regression models with GEE, to account for clustering, were used to assess the hypothesis. Available case method for missing data was used.

A total of 13,613 women with 15,376 deliveries included. Women with LOS > 6y showed higher gestational diabetes rates [16.0% vs. 10.8% (4-6y), 6.7% (0-3y)]. After adjustment, risk of SGA was lower for LOS 4-6y (154 (6.69%)) vs. LOS 0-3 (242 (7.61%)) [OR 0.83, 95% CI 0.68 – 1.03; p-value 0.09]; risk was lowest for LOS > 6 (599 (6.05%)) vs. LOS 0-3 (OR 0.68, 95% CI 0.57 - 0.81; p-value < 0.001). Women with LOS 4-6y and > 6y had a higher BMI [1.12kg/m2 (95% CI 0.84 – 1.39; p-value < 0.001) and 3.06kg/m2 (95% CI 2.78 – 3.32; p-value < 0.001)] compared to LOS of 0-3 after adjustment.

Highly acculturated Hispanic women born outside the US, do not have higher risk for having SGA offspring. Likely masked by higher pre-pregnancy BMI and gestational diabetes, alternative pathways for adverse perinatal outcomes.

**Vertebral artery aneurysms and the risk of cord infarction following spinal artery coverage during flow diversion**

Objective: Coverage of the anterior spinal artery (ASA) ostia is a source of considerable consternation regarding flow diversion (FD) in vertebral artery (VA) aneurysms due to cord supply. The authors sought to assess the association between coverage of the ASA, posterior spinal artery (PSA), or lateral spinal artery (LSA) ostia when placing flow diverters in distal VAs and clinical outcomes, with emphasis on cord infarction.

Methods: A multicenter retrospective study of 7 institutions in which VA aneurysms were treated with FD between 2011 and 2019 was performed. The authors evaluated the risk of ASA and PSA/LSA occlusion, associated thromboembolic complication, complications overall, aneurysm occlusion status, and functional outcome.

Results: Sixty patients with 63 VA and posterior inferior cerebellar artery aneurysms treated with FD were identified. The median aneurysm diameter was 7 mm and fusiform type was the commonest morphology (42.9%). During a procedure, 1 (61.7%) or 2 (33.3%) flow diverters were placed. Complete occlusion was achieved in 71.9%. Symptomatic thromboembolic complications occurred in 7.4% of cases and intracranial hemorrhage in 10.0% of cases. The ASA and PSA/LSA were identified in 51 (80.9%) and 35 (55.6%) complications and covered by the flow diverter in 29 (56.9%) and 13 (37.1%) of the procedures, respectively. Patency after flow diverter coverage on last follow-up was 89.2% for ASA and 100% for PSA/LSA, not significantly different between covered and noncovered groups (p = 0.5 and p > 0.99, respectively). No complications arose from coverage.

Conclusions: FD aneurysm treatment in the posterior circulation with coverage of ASA or PSA/LSA was not associated with higher rates of occlusion of these branches or any instances of cord infarction.
### Practicum Project Abstracts 2020

#### A population-based study evaluating neoadjuvant chemotherapy sensitivity in de novo versus progressive muscle-invasive bladder cancer in the province of Ontario

**Background:** De novo muscle-invasive bladder cancer (MIBC) are patients who on first presentation demonstrate tumour invasion into detrusor muscle. Studies have suggested that progressive MIBC – those first diagnosed with non-MIBC, then progress to MIBC – portends a worse prognosis with less sensitivity to neoadjuvant chemotherapy (NACT). Ultimately, all MIBC patients require NACT followed by radical cystectomy (RC) as gold standard curative treatment.

We established cohorts of de novo and progressors using a population-based cohort undergoing RC to determine differences in chemosensitivity and survival.

**Methods:** All patients undergoing RC in the province of Ontario between 2009–2013 were previously identified. Chi-square test was used to compare differences in pathologic downstaging as a surrogate for chemosensitivity amongst de novo versus progressors. A Cox proportional hazards model describes associations with survival.

**Results:** A total of 1573 patients underwent RC – 893 de novo patients and 680 progressors. Of those presenting with ≥ clinical T2 disease (n=847), 169 received NACT with an overall pathologic downstaging rate of 19.0%. There was no significant difference in downstaging within this group amongst de novo vs progressors [19.3% (n=115) vs 18.3% (n=54); p=1.00]. A Cox regression analysis showed no statistically significant difference in CSS [HR 0.98; 95% CI (0.85-1.14); p=0.840] or OS [HR 1.00; 95% CI (0.88-1.15); p=0.980] between all de novo and progressive MIBC patients.

**Conclusions:** There was no difference in chemosensitivity, CSS, or OS for de novo versus progressive patients in our cohort of those undergoing RC in routine clinical practice in the province of Ontario over a 5-year period.

### A Meta-Analysis of Complications Associated with Botulinum Toxin A Injections for Facial Rejuvenation

**Background:**

Botulinum toxin A (BTX-A) injections for facial rejuvenation are now the most common non-surgical cosmetic procedure in the US. New formulations have emerged, and the body of evidence has grown since previous meta-analyses. Our aim was to produce a quantitative pooled risk profile for BTX-A based on formulation and other treatment parameters.

**Methods:**

A systematic review of the literature was performed using Pubmed (1946-present) and Embase (1947-present) to identify all studies that reported safety data for healthy adults receiving BTX-A for cosmetic indications. A meta-analysis was performed to determine pooled risk ratios for treatment-related adverse events and for specific adverse events based on categories. Meta-regression, subgroup analyses, and sensitivity analyses were also performed.

**Results:**

The pooled risk ratio for treatment-related adverse events was 1.731 (95% PI: 1.48 - 2.02), with minimal heterogeneity (95% CI: 0-43%). Meta-regression did not show any significant influence based on the included covariates, but there were trends towards increased risk with higher injection volumes. Specific adverse events that were more common included: eyelid/eyebrow malposition (RR, 2.44; 95% PI, 1.38-4.30), injection site bruising (RR, 1.28; 95% CI, 0.89-1.83), and other injection site reactions (RR, 1.07; 95% PI, 0.28-4.06).

**Conclusions:**

BTX-A has a favourable risk profile that does not vary significantly based on formulation, volume, concentration, number of sites treated, and number of injections. The most reported adverse events were those restricted to the region of treatment.
Effectiveness of immune checkpoint inhibitors in advanced non-clear cell renal cell carcinoma

Background
Immune checkpoint inhibitors (ICI) have demonstrated impressive anti-tumor activity in metastatic renal cell carcinoma (mRCC), and are standard treatment options for advanced clear-cell RCC. Data supporting the effectiveness of these novel therapies in non-clear cell RCC (nccRCC) is more limited.

Methods
We performed a retrospective analysis using the international metastatic renal-cell carcinoma database consortium (IMDC). Patients with nccRCC were classified into 3 groups based on first-line therapy: ICI therapy, vascular endothelial growth factor (VEGF) inhibitors, or mammalian target of rapamycin (mTOR) inhibitors. Primary outcome was overall survival (OS). Secondary outcomes were time to treatment failure (TTF) and response rate (ORR). Kaplan-Meier method was used to compare OS and TTF between treatment groups. We used Cox proportional hazards models to adjust for prognostic covariates.

Results
1181 patients with nccRCC were identified - 77.1% received VEGF, 17.4% received mTOR, and 5.5% received ICI based therapy. Median OS in the ICI group was 28.6 months, compared to 19.2 and 13.2 in the VEGF and mTOR groups respectively. Median TTF was 6.9 months vs. 5.1 and 3.9 and ORR was 25% vs. 17.9% and 8.3% in the ICI, VEGF and mTOR groups respectively. After adjusting for IMDC risk group, histological subtype, and age, the hazard ratio (HR) for OS was 0.58 (95% CI 0.36-0.94, p=0.03) for ICI vs. VEGF and 0.48 (95% CI 0.29-0.80, p=0.005) for ICI vs. mTOR.

Conclusions
In advanced nccRCC, ICI based treatment is associated with improved OS compared to VEGF and mTOR therapy. These results need to be confirmed in prospective randomized trials.

Prognostic Awareness in Caregivers of Patients with Incurable Cancer

Title: Prognostic Awareness in Caregivers of Patients with Incurable Cancer
Authors: Gray, T.F., Forst, D., Nipp, R.D., Greer, J.A., Temel, J.S., El-Jawahri, A.

Background: While patients with advanced cancer often overestimate their prognosis, little is known about how patients and caregivers differ in their prognostic awareness, and the relationship between caregiver prognostic awareness and their psychological distress.

Methods: We conducted a cross-sectional study of 390 caregivers of adults with incurable lung, gastrointestinal, and brain cancers to assess (1) caregiver prognostic awareness, (2) factors associated with caregiver prognostic awareness, and (3) prognostic discordance in patient-caregiver dyads. We used the Prognosis and Treatment Perceptions Questionnaire to assess prognostic awareness and Hospital Anxiety and Depression Scale to assess psychological distress.

Results: 53.7% of caregivers reported the patients’ cancer as curable, and 44.1% reported the cancer was ‘not terminal’. Caregivers’ report of curability was not associated with their anxiety (OR=0.99, P=0.93) or depression (OR=1.05, P = 0.32) symptoms. Among 42.5% (124/292) and 26.0% (76/292) of dyads (N=292), both patients and their caregivers agreed in their perception of the cancer as curable and incurable, respectively. In 19.9% of dyads (n=58), patients reported their cancer as curable while their caregivers reported it as incurable. In 11.6% of dyads (n=34), patients reported the cancer as incurable while caregivers reported it as curable.

Conclusions: More than half of caregivers of patients with incurable cancer have misperceptions about the patients’ likelihood of cure, and one third of patient-caregiver dyads have discordant perceptions of prognosis. Supportive care interventions, including specialty palliative care, may help to facilitate conversations and enhance understanding about prognosis in patients with incurable cancer and their caregivers.
### Frailty to predict cardiac outcomes among patients undergoing non-cardiac surgery using data from the National Surgical Quality Improvement Program (NSQIP): 2012 – 2014

**Background:** Frail individuals are known to have increased risk of morbidity and mortality after surgery. Despite the accumulating evidence, frailty measure is not routinely used in perioperative setting.

**Methods:** We conducted a retrospective cohort analysis of 2012-2014 NSQIP data. Univariate logistic regression models were performed to examine the association between frailty measures and cardiac outcome (cardiac arrest, myocardial infarction and stroke) in patients undergoing non-cardiac surgery. Predictive performance of frailty models (mFI, RAI) was compared with traditional cardiac risk prediction models (RCRI, NSQIP risk calculator) using discrimination and calibration curves.

**Results:** Our study sample included 86,632 U.S. participants. Majority (57.9%) were less than 65 years of age and 55.7% males. Increasing frailty score was associated with increasing risk of stroke, MI and cardiac arrest (P < 0.05). C-statistic was highest for NSQIP risk score, 0.8447 (95% CI 0.831, 0.859) for MI, 0.869 (95% CI 0.851, 0.888) for cardiac arrest and 0.918 (95% CI 0.904, 0.931) for stroke. C-statistic was comparable for remaining risk prediction scores (< 0.70). Calibration plots showed poor performance of risk prediction models except NSQIP risk calculator for all cardiac outcomes.

**Conclusions:** Our findings suggest that NSQIP risk calculator is best at predicting adverse cardiac outcome. Frailty measures had comparable performance to RCRI score. We need further studies to evaluate positive correlation of frailty with adverse cardiac outcome in perioperative setting.

### Investigating Differences in Cancer Diagnosis and Survival Among South Asian Americans: A Prospective Cohort Study from the Surveillance, Epidemiology and End Results (SEER) Program, 2001-2015

**Background:** Research on South Asian Americans with cancer is limited, and much of it is many years old. This is critical, given changing patterns of survival across many cancer types. Previous studies have found that cancer incidence and death rates are generally lower among South Asians compared to other Asian groups, but this group is found to present with cancer at more advanced stages.

**Methods:** A Prospective cohort survival analysis was conducted using SEER (Surveillance, Epidemiology, and End Results) registries, following individuals diagnosed with cancer between 2001-2015. Outcomes for individuals of South Asian background (n=18,909), other Asian backgrounds (n=220,931) and Whites (n=2,781,262) were compared by multivariable logistic regression and cox regression, adjusted for age, year of diagnosis, marital status, insurance, registry state, stage, radiation, and chemotherapy treatment, and were stratified by sex and cancer type.

**Results:** South Asians were found to be more likely to be diagnosed at regional stage, and have lower odds of all-cause and cancer-specific five-year mortality and risk of mortality compared to Whites and Other Asians for most cancers, except oropharyngeal cancer where mortality is highest among South Asians, prostate cancer where mortality is higher among South Asians compared to Other Asians for five year mortality, and testicular cancer where South Asians and Whites do not have a significant difference but which is significantly highest among Other Asians. All odds of mortality are lower when adjusted for insurance.

**Conclusions:** South Asians and Other Asians do have some differences in outcomes, where most show better odds of survival for South Asians.

### HIV-1 Viral Load Suppression among Pediatric Clients in Lusaka, Zambia

**Background:** UNAIDS estimates 150,000 Zambian children aged 0 to 18 years are HIV-positive. Universal test and treat programs have increased ART initiation among pediatric clients, however limited viral load monitoring occurs in resource-limited settings. Here, we sought to describe the HIV care cascade in Zambia, rates of viremia and determine predictors of viremia among individuals 0 – 18 years of age.

**Methods:** Electronic medical records were used to extract data. The outcome variable was viremia (viral load above 1000 copies of RNA/ml of blood). The exposure variables were age, sex, care facility, age at diagnosis, age at ART initiation, years in care, WHO stage, CD4 count and ART regimen. Analysis included
Degree: MPH-45  
Field of Study: Epidemiology  

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descriptive statistics, logistic regression and survival analysis.
Results: 76,552 individuals from 5 health facilities met study criteria, 7 % of these individuals had complete data. Despite guidelines, 70 % of individuals obtained HIV diagnoses beyond age 2. Increasing stringency of ART initiation decreased the time to initiation (median start time > 30 days from diagnosis). ART initiation between 10-15 years is associated with 2.7(p=0.017) times the odds of being viremic compared to individuals aged 15 - 18 years. Being on ART regimen containing protease inhibitors(PI) was associated with higher (OR=2.13, p < 0.001), and on dolutegravir-containing associated with lower odds (OR=0.15, p < 0.001) than those on regimens containing neither. Consistently, survival analyses found the incidence of viremia to be higher in PI-containing regimens and incidence lower in DTG-regimens.
Conclusions: Pediatric HIV care guidelines are followed with suboptimal fidelity in Zambia. First-line regimens including DTG should be considered, even for young, pediatric clients.

The impact of community on parental vaccination decisions: An analysis of vaccine exemptions using county-level sociodemographic indicators

Background: Exemptions from school immunization requirements are on the rise. Exemptions cluster in certain geographic areas and looking at sociodemographic factors of these regions may help influence targeted interventions to address issues of vaccine hesitancy.
Methods: Logistic regression was used to examine whether county-level attributes, including political affiliation, religious affiliation, and socioeconomic and demographic factors (education attainment, race/ethnicity, median household income, and insurance status) are associated with the odds a child will have an immunization exemption. A sensitivity analysis was performed to see if the effect of sociodemographic exposures vary between census regions.
Results: Increasing county-level republican political affiliation(OR=1.006, 95%CI 1.005-1.007), percent of residents with a bachelor’s degree(OR=1.018, 95%CI 1.016-1.021), percent of uninsured children(OR=1.036, 95%CI 1.033-1.038), percent of American Indian/Alaskan Native residents(OR=1.002, 95%CI 1.001-1.003), and percent adherence to the Evangelical Protestant(OR=1.003, 95%CI 1.001-1.004) or United Methodist(OR=1.004, 95%CI 1.000-1.008) religions, were associated with increased odds a child would have an exemption. Importantly, the impact of sociodemographic factors varied by census region highlighting the importance in creating community-targeted interventions to decrease vaccine-hesitancy. Strongest predictor in each region: [Northeast: Adherence to Latter-day Saints religion(OR=1.096, 95%CI 1.066-1.126), Midwest: percent of Asian residents(OR=1.068, 95%CI 1.058-1.078), South: Adherence to Mainline Protestant Religion(OR=1.059, 95%CI 1.050-1.068), and West: Adherence to Orthodox Christian religion(OR=1.369, 95%CI 1.316-1.425)].
Conclusions: County-level demographic attributes are associated with the odds of a child having an exemption, though the impact of these attributes varies among census regions. Interventions targeted towards a communities vaccination-decisions driver(s) is necessary to reduce rates of non-medical exemptions from school requirements.
Differences in Time to Return to Work among Patients Undergoing Staged versus Simultaneous Bilateral Total Knee Arthroplasty

Background:
A large proportion of patients undergoing total knee arthroplasty (TKA) have severe osteoarthritis in both knees and may consider either simultaneous or staged bilateral TKA. We hypothesized that employed patients who underwent simultaneous bilateral TKA would have significantly fewer days missed from work compared to the sum of days missed from each surgery for patients who underwent staged bilateral TKA.

Methods:
The prospective arthroplasty registry at Hospital for Special Surgery was utilized. We identified 61 employed patients who had undergone staged bilateral TKA and 152 employed patients who had undergone simultaneous bilateral TKA and had completed the registry’s return to work questionnaire. We used a linear regression model, adjusting for potential confounders including age, sex, pre-op BMI, and work type, to analyze workdays lost after staged versus simultaneous bilateral TKA.

Results:
Staged TKA patients missed a mean total of 67.9 ± 46.1 days of work across both TKA surgeries, compared to 46.5 ± 29.0 days missed in the simultaneous TKA group (p < 0.001). In multivariate linear regression analysis, the staged TKA group missed 23.88 ± 6.22 more days of work compared to the simultaneous TKA group (95% CI 11.60-36.17, p < 0.001).

Conclusions:
After accounting for age, pre-op BMI, sex, and work type, employed patients undergoing simultaneous bilateral TKA missed 24 fewer days of work over the course of their surgical treatment and rehabilitation compared to those undergoing staged bilateral TKA. This information may be useful to surgeons counseling patients with bilateral knee osteoarthritis about staged versus simultaneous bilateral surgery.


Background: Several studies suggest a potentially protective effect of higher water intake on kidney function. However, it remains controversial whether a more direct indicator of hydration measured by urine osmolality, is associated with kidney function.

Methods: We conducted a cross-sectional analysis of 2009 - 2012 NHANES, a standardized epidemiological survey. Logistic regression models were performed to examine the association between osmolality quartiles and chronic kidney disease (CKD) stage 1-5, weighted for sampling scheme. The secondary outcomes included CKD stage 3-5, glomerular filtration rate, and albuminuria. Models were adjusted for relevant demographic, social, dietary and cardiovascular risk factors.

Results: Our study sample included 7,373 U.S. participants. The mean osmolality in each quartile was 250.0, 540.5, 756.9 and 963.0 mOsm/kg. CKD stage 1-5 was observed in 116 (6.2%), 213 (8.6%), 179 (7.5%), and 102 (4.3%) participants in the lowest to highest quartiles. As compared with the lowest quartile, the highest quartile was associated with a lower risk of CKD stage 1-5 (odds ratio [OR] 0.80, 95% confidence interval [CI] 0.60, 1.09), CKD stage 3-5 (OR 0.68, 95% CI 0.24, 1.92) and albuminuria (OR 0.76, 95% CI 0.51, 1.14) even after adjustment. However, the risk was higher among participants age < 40 and male (p interaction = 0.071, 0.204). As compared with the reference group, the lower quartiles were associated with a higher risk of kidney outcomes.

Conclusions: Higher urine osmolality was associated with a lower risk of kidney outcomes. This suggests that urine osmolality reflects preserved renal concentrating ability rather than hydration.
**Longitudinal association between within-visit blood pressure variability and development of hypertension**

**Title:** Longitudinal association between within-visit blood pressure variability and development of hypertension among overweight/obese individuals  
**Authors:** Dongwook Kim, Kaumudi Joshipura  
**Background:** Traditionally, blood pressure variability (BPV) has been considered as a hindrance to obtaining correct blood pressure level; however, recent studies suggest that short term systolic BPV such as within-visit BPV is longitudinally associated with diabetes, cardiovascular outcome, and end-organ damage. Yet it is less clear whether such is mediated through hypertension. In this paper, we aim to investigate whether within-visit BPV, the maximum difference between three measures taken 1-min apart serially, cause hypertension among normotensive overweight/obese individuals.  
**Methods:** Descriptive analysis of baseline characteristics according to exposure systolic BPV < 10mmHg, systolic BPV ≥ 10mmHg, diastolic BPV < 10mmHg, and diastolic BPV ≥ 10mmHg. The crude analysis and multivariable adjusted analysis performed according to age, sex, BMI, physical activity, smoking, alcohol consumption, and high salt intake. All statistical procedures were performed with STATA /IC15.1.  
**Results:** Individuals with systolic within-visit BPV of ≥ 10mmHg had 0.81 (95%CI 0.40, 1.66) times the risk of developing hypertension compared to individuals with systolic within-visit BPV of < 10mmHg. After controlling for potential confounders and variables associated with outcome, the effect estimate was 0.79 (95% CI 0.39, 1.61). Individuals with diastolic within-visit BPV of ≥ 10mmHg had 1.24 (95%CI 0.55-2.79) times the risk of developing hypertension compared to individuals with diastolic within-visit BPV of < 10mmHg. After controlling for potential confounders and variables associated with outcome, the effect estimate was 1.17 (95%CI 0.51-2.66).  
**Conclusions:** There was no significant association between within-visit blood pressure variability and development of hypertension among normotensive obese/overweight individuals.

**Psychosocial Occupational Exposures and Healthcare Utilization: A Study from the 2015 National Health Interview Survey**

**Background:** There is limited evidence investigating workplace factors and healthcare utilization. We evaluated the relationship between psychosocial occupational exposures and doctor’s visits, ED visits, and mental health professional visits.  
**Methods:** We extracted data from the 2015 National Health Interview Survey (NHIS), an annual, cross-sectional survey taken among the U.S. nonmilitary, noninstitutionalized population. Our primary exposure was a summary score of 9 psychosocial occupational exposures, modeled after and validated against the K6 scale. We computed weighted multinomial and binary logistic regression models to examine associations between the summary score, and the 9 individual exposures, to doctor’s visits, ED visits, and mental health professional visits, controlling for patient characteristics.  
**Results:** The summary score’s cutoff point of 7.85 was correlated to the K6 score’s cutoff point of 13. Neither less than nor greater than 7.85 summary score groups were associated with doctor’s visits. The greater than 7.85 group had 4.8% increased odds (OR:1.048, p-value:0.007) of at least 1 ED visit and 7.7% increased odds (OR:1.077, p-value:0.005) of at least 1 mental health visit, after adjustment. Secondary analyses show several significant relationships between the individual psychosocial occupational exposures and doctor’s visits, ED visits, and mental health visits.  
**Conclusions:** After adjustment, the summary score was not associated with doctor’s visits, but the greater than 7.85 summary score group was associated with ED visits and mental health visits. Some psychosocial workplace factors were associated with healthcare utilization. Additional research is needed.
**Metformin continuation and pregnancy outcomes in women with type 2 diabetes: emulation of a target trial using routinely collected healthcare data.**

**Background:**
Use of metformin during pregnancy could alleviate the problems by exclusive insulin therapy, if demonstrated safe to pregnant women and fetus. This study aims to estimate the effect of metformin continuation during pregnancy on pregnancy outcomes among women with pregestational type 2 diabetes who were being treated with both insulin and metformin pre-pregnancy.

**Methods:**
Using a pregnancy cohort in the IBM MarketScan Health Database 2011-2015, we emulate a target trial comparing two treatment strategies: metformin continuation vs. discontinuation. We include type 2 diabetes patients treated with both metformin and insulin pre-pregnancy. The primary outcome is a composite of pregnancy loss, preterm birth, birth injury, respiratory distress, neonatal hypoglycemia, and intensive care unit admission. The secondary outcomes include the individual components of the primary outcome, as well as large for gestational age, acidosis, sepsis, hyperbilirubinemia, shoulder dystocia, pre-eclampsia, caesarean delivery, and maternal hypoglycemia. We estimate risk differences using person-time pooled logistic regression model with bootstrap resamples.

**Results:**
Compared to metformin discontinuation, metformin continuation had adjusted risk difference of -0.50% (-7.80%, 6.30%) for the primary composite outcome, -1.30% (-10.10%, 8.00%) for the secondary composite outcome, 1.60% (-4.90%, 8.20%) for preterm delivery, 1.60% (-1.30%, 11.50%) for pre-eclampsia, and -3.30% (-10.40%, 4.00%) for large for gestational age.

**Conclusions:**
Metformin continuation does not increase overall risk for adverse pregnancy outcomes. This evidence does not support the current clinical guideline of metformin discontinuation during pregnancy.

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**The interaction of frailty and stoma creation on early post-operative readmission following colorectal surgery**

**Background:**
Stoma creation increases early post-operative readmission risk following colorectal surgery. Decreased physiologic reserve and polypharmacy may potentially place frail patients with new stomas at particularly high risk of readmission. Currently it is unknown how stoma creation interacts with frailty to modify readmission risk in the colorectal population.

**Methods:**
We conducted a retrospective cohort study utilizing the NSQIP database to evaluate the interaction between frailty, ostomy creation, and any early post-operative readmission in a cohort of adult patients undergoing colorectal resection between 2014-2018. Kaplan Meier curves and Cox-proportional hazards models were constructed to evaluate both time-to-readmission and hazard of readmission based on the modified frailty index (mFI) and stoma presence.

**Results:**
191,659 patients were included. Both frail patients without stomas (HR 1.31, 95% CI 1.25-1.38, p < 0.001) and non-frail patients with stomas (HR 1.81, 95% CI 1.75-1.88, p < 0.001) had increased hazard of early readmission. These risk factors interacted to further increase readmission hazard among frail patients with stomas (HR 4.98, 95% CI 4.27-5.81, p < 0.001). When only readmissions due to dehydration or acute kidney injury were considered, hazard of readmission among frail patients without stomas (HR 1.94, 95% CI 1.55-2.43, p < 0.001), non-frail patients with stomas (HR 3.86, 95% CI 3.31-4.51, p < 0.001), and frail patients with stomas (HR 37.4, 95% CI 20.0-69.8, p < 0.001) was greater.

**Conclusions:**
Frailty and stoma presence interact to increase the risk of early post-operative readmission following colorectal resection, particularly readmissions due to acute kidney injury or dehydration. This has implications for patient counseling, optimization, monitoring, and management.
### Management of CNS metastases in EGFR mutated NSCLC treated upfront with a tyrosine kinase inhibitor.

**Background:**
Brain metastases (BMs) are common in epidermal growth factor receptor (EGFR) mutated non-small cell lung cancer (NSCLC) and are associated with significant morbidity. However, patients with BMs often get excluded from clinical trials and the optimal management remains unknown. We sought to characterize the management strategies and outcomes to inform on clinical decisions.

**Methods:**
We reviewed all EGFR mutated stage 4 NSCLC treated with a first line tyrosine kinase inhibitor (TKI) between 2014 to 2019. The primary outcomes of interest are progression free survival (PFS). Associations with radiation (RT) modality and screening strategies will be examined using the Kaplan Meier method. Cox regressions will be performed to adjust for the graded prognostic assessment score (GPA) scores and the size of the largest BMs.

**Results:**
Among 204 eligible patients, BMs were found in 55%, 38% at baseline. Patients with BMs had worse PFS (11.6 vs 16.3 months, p < 0.01). Treatment with whole brain (WB)RT had worse PFS compared to TKIs alone (HR 2.4, p=0.004) or stereotactic radiosurgery (SRS) (HR 2.8, p=0.002) even after adjusting for confounders. Patients with baseline BMs identified by screening had similar GPA scores but smaller BMs (p=0.02). They also had a better PFS (13.4 vs 8.9 months, p=0.02). This remained significant in the subgroup of patients who did not receive WBRT (multivariate HR0.40; p=0.02).

**Conclusions:**
EGFR mutated NSCLC patients with BMs have worse outcomes. Those with baseline BMs found by screening had smaller BMs and superior PFS and a screening MRI should be considered in all patients.

### The incidence and characterization of diagnostic process errors among patients with bacteremia at The Ottawa Hospital and Brigham and Women’s Hospital

**Background:** The usefulness of triggers in the identification of diagnostic process errors (DPEs) has not yet been demonstrated. Bacteremia is an important target for the study of DPEs as delayed diagnosis and treatment can lead to poor outcomes.

**Methods:** We performed a retrospective cohort study at The Ottawa Hospital (TOH) and Brigham and Women’s Hospital (BWH) in 2016. We included positive blood cultures that were drawn within 12 hours of presentation and excluded contaminated blood cultures. We identified a “trigger” cohort of cases that did not receive antibiotics within 24 hours. Within our trigger cohort, we identified cases with DPEs using the Diagnostic Error Evaluation Research (DEER) Taxonomy. Our primary exposure was the presence or absence of DPE. Our primary outcome was readmission within 30 days. We used multivariable logistic regression controlling for Escobar comorbidity index.

**Results:** At TOH, we identified 73/1478 cases (4.9%) meeting our trigger definition. 68/73 (91.3%) of the trigger cases were found to have at least one DPE. Most DPEs were related to “Assessment” followed by “History.” We found that readmission was more common among cases with DPEs (OR 1.8, 95% CI 0.8-4.0), but this relationship did not reach statistical significance. Preliminary work at BWH has identified 42/973 cases (4.3%) meeting the trigger definition, of which 23/42 (54.8%) had evidence of at least one DPE.

**Conclusions:** We have demonstrated that using triggers in hospital databases may be helpful in identifying and understanding the impact of DPEs for conditions such as bacteremia.
Alcohol Policies and Motor Vehicle Crash Deaths Involving Alcohol Below 0.08%

Background: Motor vehicle crashes (MVCs) are a leading cause of injury death in the United States. Restrictive alcohol policies protect against alcohol-involved crashes involving alcohol above the legal blood alcohol concentration (BAC) of 0.08%. Characteristics of MVC fatalities involving alcohol below the BAC limit and their relationships to alcohol control policies have not been well characterized.

Methods: MVC fatality data and crash and decedent characteristics from 2000-2015 come from the Fatality Analysis Reporting System and were analyzed in 2018-2019. Alcohol Policy Scale (APS) scores characterized alcohol policy environments by state-year. Generalized estimating equation alternating logistic regression models were used to assess APS scores and the odds a fatality involved alcohol below the legal threshold.

Results: Of 612,030 MVC fatalities, 223,471 (37%) died in alcohol-involved crashes, of which 33,965 (15% of alcohol-involved fatalities, or 6% of all fatalities) had a BAC < 0.08%. A 10-percentage point increase in APS, approximating the interquartile range among states, was associated with reduced odds of fatalities involving alcohol < 0.08% vs. 0.00% (aOR 0.91, 95% CI 0.89 – 0.93). These findings held across multiple subgroup analyses by decedent and crash characteristics. Similar results were found for odds of alcohol involvement < 0.05% vs. 0.00% (aOR 0.90, 95% CI 0.88 – 0.93), and ≥ 0.05% but < 0.08% vs. < 0.05% (aOR 0.93, 95% CI 0.89 – 0.96).

Conclusions: The number of lower BAC fatalities is substantial. States with more restrictive alcohol policies tend to have reduced odds of lower-BAC MVCs than states with weaker policies.

Association between statin use and risk of inflammatory bowel diseases.

I used Swedish health registry data to evaluate the association between use of statins and risk of the inflammatory bowel diseases (IBD), Crohn’s disease and ulcerative colitis. Outcomes were ascertained from diagnostic codes in the inpatient and outpatient registries, using a previously validated definition of IBD. Exposure information was extracted from the prescribed drug register and several definitions of statin exposure were developed based on dispensed statin prescriptions. Covariate information was obtained using all of the registry resources. The study used a case control design, with each IBD case matched to ten reference individuals in the total population registry, based on age, sex, and region of residence. I conducted all of the analyses using SAS. Estimates were generated from conditional logistic regression models adjusting for potential confounders. After presenting my project proposal to clinical epidemiologists and gastroenterologist at the Karolinska Institute, I was able to remotely access the data for the project through VPN.
### Participation in full-contact intercollegiate athletics (1916-1954) and risk of mortality from neurodegenerative diseases.

**Background:** Contact sports have been implicated as an etiologic factor for mortality resulting from underlying neurodegenerative diseases. Studies have reported this association among professional athletes, but its importance for athletes exposed through intercollegiate sports is not well understood. This investigation compared cause-specific mortality from neurodegenerative diseases between non-athletes, intercollegiate partial- and non-contact sport athletes, and full-contact sport athletes.

**Methods:** The Harvard Alumni Health Study (HAHS) is a prospective cohort of 32,835 men who matriculated at Harvard between 1916 and 1950 and completed physical examinations at college-entry. A subset of men were known varsity athletes, having met criteria to receive major “H” awards for their participation in sports during college. Participants were classified as non-athletes (NA), partial- and non-contact sport athletes (NC), and full-contact sport athletes (FC). The cohort was followed from graduation for cause-specific mortality from neurodegenerative diseases through 1998 for all participants, and through 2008 for participants responding to the 1988, 1993, or 1998 questionnaire.

**Results:** Over a median follow-up time of 55-years, 627 (1.91%) participants died due to underlying neurodegenerative diseases. Crude models showed no appreciable difference in hazard between athlete groups when compared with non-athletes (NC: HR=1.35; 95%CI: 0.93-1.95, FC: HR=1.19; 95%CI: 0.73-1.92). Models adjusted for matriculation period and smoking status yielded similar results (NC: HR=1.56; 95%CI: 0.94-2.59, FC:HR=1.03; 95%CI: 0.49-2.20).

**Conclusions:** This study found no association between participation in intercollegiate full-contact sports and risk of mortality from underlying neurodegenerative diseases. The small number of outcomes is an important limitation that may have influenced our ability to detect meaningful differences between groups.

### The management of young women with breast cancer in Switzerland: a snapshot

**Background:** An increase in the incidence of breast cancer (BC) in young women (YW) as well as disparities in BC outcome in Switzerland have been reported. We sought to evaluate treatment and outcome differences, in YW, between the two linguistic/geographic regions of the country.

**Methods:** YW with BC diagnosed between 2000 and 2014 were identified through 9 population-based cancer registries and followed until 12/2018. Concordance with international guidelines was assessed for 12 items covering clinical and surgical management, combined in a “quality of care score”. We compared score and survival outcome differences between the 2 regions and we evaluated the impact of quality of care on survival.

**Results:** We included 2'477 women ≤ 40 years, diagnosed with stage I-III BC between 2000 and 2014. Median age at diagnosis was 37.3 years (IQR 34.1-39.4 years), 47% of women had stage II BC, and 67% had hormone receptor positive cancer. Mean quality of care score was higher in the Latin compared to the German region of the country (85.96% vs 83.2% respectively, p < 0.0005). Similarly, five- and 10-year overall survival rates were higher in the Latin region compared to the German (92% vs 90% and 84% vs 81%, respectively, p = 0.0025). There was no difference in survival according to the score.

**Conclusions:** Overall YW with BC were well treated. However, women in the Latin region had a higher quality of care score and better 5- and 10-year survival. National guidelines for the management of YW with BC should be implemented.

### Efficacy of fibrates in patients with primary biliary cholangitis

**Background:** Primary biliary cholangitis is a progressive liver condition with limited treatment options, including ursodeoxycholic acid (UDCA). This review aims to assess efficacy and safety of fenofibrate (FF) and bezafibrate (BF) as second-line therapy.

**Methods:** We searched Ovid Embase, Medline, Web of Science, Cochrane library, and clinicaltrials.gov for randomized trials, cohort and case-control studies assessing...
BF/FF as second-line therapy in PBC-only patients. Two authors reviewed and extracted data on outcomes of interest including alkaline phosphatase (ALP) and adverse events. We analyzed pooled effect estimates with random effects model (DerSimonian-Laird), and adverse events with fixed effects model (Peto odds ratio, given rarity of events), using STATA 15.

Results:
Twenty-six studies were included. Risk of bias was rated low-moderate across domains. Combination therapy with fibrate had greater reduction in ALP compared to UDCA-monotherapy in randomized trials (WMD -0.90x upper limit of normal [95%CI -1.12, -0.69], I2=77.8%), intervention studies (-0.79 [-1.01, -0.58]) and retrospective cohort studies (-0.67 [-0.97, -0.38]). Sensitivity analyses by fibrate and publication types yielded similar results. There was increased risk of elevated liver enzymes (OR 5.2 [1.15, 23.62]), creatinine (OR 8.48 [1.16, 62.13]), and creatine phosphokinase/myalgia (OR 3.23 [1.36, 7.71]) with combination therapy. There was no significant publication bias on funnel plot.

Conclusions:
Bezafibrate and fenofibrate can further reduce ALP level when used in combination with UDCA as second-line therapy, but clinicians should monitor for potential adverse effects. Larger studies with longer follow-up are needed.

The relationship between serum total cholesterol and statin use on intraocular pressure (IOP)

Title: The relationship between serum total cholesterol and statin use on intraocular pressure (IOP)

Authors: Mathew Palakkamanil, Jae Hee Kang, Louis Pasquale

Background: Primary open angle glaucoma (POAG) is a multifactorial condition characterized by a progressive optic neuropathy and resultant blindness. It is the most common cause of irreversible blindness worldwide, yet the pathophysiology remains unclear. Currently, intraocular pressure (IOP) is the only modifiable risk factor to reduce progression, thus, primary prevention is critical for averting its debilitating consequences. Studies have investigated the association between serum lipid and statins on IOP, however, the results have been conflicting.

Methods: This study aims to determine the relationship between total cholesterol and statin use on IOP, through a cross-sectional, database analysis. The UK Biobank, a health database, was used for the analysis. IOP and serum lipid values were collected at initial assessment. Multiple linear regression was performed for the association of both total cholesterol and statin use with IOP, controlling for age, sex, deprivation, body mass index, smoking history, alcohol use, ethnicity, beta-blockers, coronary artery disease, dyslipidemia and hypertension.

Results: 102,577 participants were included in the analysis. Serum total cholesterol had a significant positive correlation to IOP (beta = 0.156; p-value = < 0.0001; CI (0.133, 0.180)). There was no significant association between statin use and IOP. For participants older than 55 years, there was a significant positive correlation between statin use and IOP (beta = 0.131, p-value = 0.003, CI (0.46,0.216).

Conclusion: The identification of factors to modulate IOP, prior to the onset of the disease, is of utmost important given the growing prevalence of POAG. Our study suggests a correlation between serum total cholesterol levels and intraocular pressure.
**Association between adoption of EMR and patient safety in US hospitals**

**Background:**
The adoption of EMR has been popular after the enactment of Health Information Technology for Economic and Clinical Health. This research aims to evaluate the association between the adoption of electronic medical record (EMR) and patient safety, measured by AHRQ (Agency for Healthcare Research and Quality).

**Methods:**
A retrospective cohort study was conducted using public databases with data on EMR adoption and patient safety indicators from US hospitals. EMR adoption in stages 0-7 was the primary exposure. Stage 7 indicated a fully functional EMR system adopted. Then the adoption stage was dichotomized into two categories for stage = 7 and the others.

The Patient Safety and Adverse Events Composite (PSI-90), defined by AHRQ, was the primary outcome. It provides an overview of hospital-level quality related to potentially preventable hospital-related events associated with harmful outcomes for patients.

Crude analyses were conducted using the primary outcome and primary exposure using ordinal logistic and linear regressions. Then covariates were adjusted.

**Results:**
Crude analysis indicated a statistically significant association between the EMR adoption and composite patient safety score. However, the direction of the association disproved the hypothesis. Adjusted analyses also showed no statistical association between EMR adoption stage and composite patient safety score, after adjusting for number of beds, number of residents, hospital asset and regions.

**Conclusions:**
There wasn’t a significant association between EMR adoption and patient safety score, after adjusting for covariates related to hospital characteristics.

**Prediction of treatment success from Assisted Reproductive Techniques in a nationwide Swedish cohort using Machine Learning**

**Background:**
One in six couples experience infertility, and Assisted Reproductive Techniques (ART) currently accounts for 1-5% of all live births in Europe and the United States. Factors currently known to affect the success-rate of ART include maternal age, cause of infertility and number of years trying to conceive. There are likely many unidentified or underappreciated factors, and Machine Learning-based methods may help identify some of these.

**Methods:**
We conducted an exploratory study in a nationwide cohort of all ART treatments in Sweden between 2007-2017 to allow identification of previously unknown predictors of ART success. Supervised Machine Learning models were trained on register data that contained history of medical conditions and drug-usage from couples undergoing ART. The primary outcome was prediction of successful clinical pregnancy and live birth after the first ART-cycle. SHAP analysis was conducted to rank the relative importance of predictors.

**Results:**
46,017 couples underwent a total of 146,624 ART-cycles between 2007-2017, fulfilled eligibility criteria and were included for analysis. The best prediction model was a gradient boosted tree ensemble (XGBoost), which achieved an area under the receiver operating curve of 0.571 and 0.616 modeled at the pre- and post-treatment stage respectively. Underappreciated predictors found to affect the success rate of ART included education, country of origin, neurotic psychiatric disease and history of benign tumors.

**Conclusions:**
Machine Learning models using large register data from individuals experiencing infertility could not predict success of ART with high accuracy, but identified previously underappreciated factors to be considered for future study.
Use of Actipatch device on patients with anterior uveitis

Title: Use of Actipatch device on patients with anterior uveitis
Authors: Maria Pefkianaki MD MSc PhD FEBO, George N. Papaliodis, MD

Background:
The device commercially known as Actipatch, is a pulsed electromagnetic device that delivers a low power electromagnetic field that penetrates the anterior segment of the eye. There have been earlier studies demonstrating that endothelial tight junctions re-establish more rapidly when exposed to an electromagnetic field. This is the mechanism by which the product obtained FDA approval, reduction of swelling/edema after blepharoplasty.

Anterior uveitis involves inflammation of the iris and/or ciliary body and is the most common intraocular inflammation in ophthalmological practice. It can be attributed to an infectious or immune-mediated genesis and can be associated with systemic diseases.

Methods:
A prospective cohort design was used to test for efficacy between the placebo and active group across three (3) observations. Patients were randomized to either the pulsed electromagnetic field therapy group along with standard of care therapy (active) or the standard of care group (control). Participants had documentation of Visual Acuity, inflammation and ocular injection at Day 0 (initiation of treatment), Day 3, and Day 7 post-treatment.

Results:
There was significant reduction of inflammation across both groups.

Conclusions:
The use of pulsed electromagnetic energy did not have a better effect on inflammation versus placebo.

Patent Ductus Arteriosus Closure Surgery in Extreme Premature Patients, A Retrospective Cohort

Background: Patent Ductus Arteriosus (PDA) is the most common cardiac malformation amongst extreme prematures. However no study has determined if it needs to be closed and if so, the most appropriate conduct; retrospective studies have analyzed developmental outcomes after surgery. This study analyzes the effect of surgical closure of PDA on the development of retinopathy of prematurity (ROP) in extreme premature patients born with <1000g.

Methods: retrospective cohort study of extreme premature patients with birth weight < 1000g born with a PDA (N = 1,407). Subjects underwent surgical closure by left lateral thoracotomy (n = 108) or non-surgical closure/expectant approach (n = 1,299) during their newborn hospitalization. Diagnosis of ROP was done at post gestational age established by the American Pediatrics Association. Logistic regression and propensity score (PS) were used to analyze surgery effect on ROP development and adjust for a priori established confounders. Cohort obtained from the 2016 Kid’s Inpatient Dataset (KID), representing a sample of discharges from the State Inpatient Dataset (SID), ages 0 - 20. Samples 10% of normal newborn and 80% of other pediatric discharges, excluding rehabilitation and long-term acute care hospitals.

Results: PDA closure surgery had no effect on ROP development (OR, 1.50; 95% CI, 0.99 – 2.27; p-value = 0.051) even after adjusting for confounders (OR, 1.45; 95% CI, 0.94 – 2.22; p-values = 0.086). PS regression showed similar results (OR, 1.41; 95% CI, 0.92 – 2.17; p-value = 0.1).

Conclusions: left lateral thoracotomy compared to non-surgical approach showed no decrease in risk of ROP development.
**Assisted reproductive techniques (ART) and the risk of childhood cancers: long-term follow-up of children born after ARTs using Swedish register data.**

**Background:** Use of ART has helped millions of couples to overcome involuntary childlessness, yet concerns about its safety have been raised especially in relation to interrupted tumor suppression. The goal of this study is to evaluate whether ART increases the risk of childhood cancer.

**Methods:** Information on all 3.1 million children in the Swedish Medical Birth Register between 1983 and 2014 was linked to the Cancer register, Cause of Death register, Quality register for IVF, National Patient register and Migration register. All children conceived with ART were first compared to all children conceived without ART, then to children of couples with known trouble conceiving. A stratified Cox Proportional Hazards model was used to estimate hazard ratios (HRs) and their 95% confidence intervals (CIs) for any childhood cancer and the following specific cancer groups: leukemia, lymphoma, CNS tumors, and other.

**Results:** Overall, the hazard of cancer in children conceived with ART was 21% higher than in the full population (HR 1.21, 95%CI 1.03-1.43). After adjustments for potential systematic differences between groups, this hazard was attenuated a bit (HR 1.16, 95%CI 0.97 – 1.38). When compared to children of couples with infertility, the hazard was even smaller (HR 1.08, 95%CI 0.89-1.31). Finally, after further adjustments, there was no difference (HR 1.03, 95%CI 0.83-1.26). Similar results estimated with poorer precision were obtained for the specific cancer subgroups.

**Conclusion:** Overall risk for childhood cancer is not increased due to ART. The relation to specific cancer types will require further verification in even larger samples.

**Salivary HPV DNA status following treatment of p16+ oropharyngeal squamous cell carcinoma**

**Background:** Human papillomavirus (HPV) is a well-recognized etiologic agent for oropharyngeal squamous cell carcinoma (OPSCC), accounting for the majority of new cases. Little is known about the natural history of HPV infection in the context of HPV-positive OPSCC (HPV-OPSCC). Using a validated saliva assay, we sought to determine whether patients exhibit persistent HPV infection following OPSCC treatment, and if this affects their recurrence risk. If so, this information may be used to risk-stratify patients and guide follow-up.

**Methods:** A sample of patients treated for HPV-OPSCC at a single institution between 2014-2017 was randomly selected. Alive and consenting patients underwent saliva sample collection. Samples were tested for the presence of HPV DNA. We will describe the proportion of patients with persistent HPV infection following OPSCC treatment. Using multivariable logistic regression, we will study the associations of sociodemographic and clinical variables with post-treatment HPV persistence. We will also examine HPV persistence in relation to cancer recurrence using Cox proportional hazards. Salivary sample analyses are ongoing, so cohort demographics are presented.

**Results:** A total of 70 participants were enrolled between September 2019 - March 2020. Participants’ mean age at diagnosis was 59 years. 87% were male. 54% had been treated for HPV-OPSCC of the tonsil, and 44% base of tongue. The majority were treated for stage I disease (67% stage I, 30% stage II, 3% stage III). No patients had suffered cancer recurrence at study enrollment.

**Conclusions:** Determining HPV status following OPSCC treatment could risk-stratify patients and guide follow-up protocols. Analyses are forthcoming.

**Sexual orientation, emotional support, and satisfaction with life**

**Title:** Sexual orientation, emotional support, and satisfaction with life

**Authors:** Dr. Rashmi Rathee

**Background:** Poor emotional and mental health with diseases like Depression are distressing for patients as well as their loved ones. This is insistent for the Lesbian/Gay, and Bisexual (LGB) community as researchers have documented a higher prevalence of depressive disorders in these groups as compared to their heterosexual peers. Emotional support can allay stressful feelings and increase satisfaction in life resulting in reduced psychological disorders. This study
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**Sexual Minority Groups vs. Heterosexual Peers**

**Methods:** This is a retrospective, cross-sectional study of “The Behavioral Risk Factor Surveillance System (BRFSS)” dataset from the years 2014-2017. Data is collected separately by each state every year from 2014 to 2017. All data is collected through computer-assisted telephone interviewing systems. The study subjects who did not answer the questions of interest defined as exposure (sexual orientation) and/or outcome (emotional support/satisfaction in life) were excluded from the study.

**Results:** 729,155 respondents were evaluated of which 685,096 were straight, 10,353 were Lesbian/Gay, 11,255 were bisexual, and 22,451 responded with other/don’t know/refused to answer. Bisexual participants reported highest relative risk of having least emotional support followed by lesbian/gay participants as compared to straight participants. Bisexual participants also had the highest relative risk of feeling dissatisfied in life as compared to straight individuals, followed by lesbian/gay participants.

**Conclusions:** Sexual minority groups experience less availability of emotional support and low perceived satisfaction in life than straight heterosexual individuals.

**Hair: A Barrier to Physical Activity in Black Women?**

**Background:** Four out of five Black women in the US are overweight/obese and have the highest rates of obesity. African Americans have higher rates of cardiovascular disease due to hypertension, hyperlipidemia, and diabetes, and are 20% less likely to participate in physical activity compared to non-Hispanic whites. This study aims to evaluate if hair styling practices are a barrier to physical activity (PA) in Black women.

**Methods:** Cross-sectional study, with a study population comprised of self-identified Black Women, ages 18+, in Detroit, Michigan with convenience sampling in a primary care office & the local YMCA in 2016. Univariate & multivariate logistic regressions were used for the analysis.

**Results:** Black women wearing natural hairstyles were 1.62 (1.06 – 2.46) times more likely to achieve 150 minutes of PA/week than those with treated hairstyles. Wig wearers were not more likely to achieve the same goal. Participants who “believed the exercised enough” had a statistically significant (p>0.00) odds ratio, 2.74 (1.65 – 4.52), of achieving 150 minutes of PA/week, with a natural hairstyle compared to those with treated styles.

**Conclusions:** Black women who wear their hair in natural styles are more likely to meet physical activity goals set by the U.S. Preventative Health Task Force, independent of income and education, likely associated with obesity. Wearing a wig, braids, hair additions/weaves, dreadlocks nor sistalocs appear to be associated with increased physical activity.

Clinicians should discuss hair & physical activity with their African American, female patients. Educational tools and scripts need to be created for clinicians.
Knowledge and Attitudes of 3rd and 4th Year Medical Students about Evidence-Based Medicine (EBM)
Title: Knowledge and Attitudes of Third- and Fourth-Year Medical Students About Evidence-Based Medicine
Author: Paul Salama, MD
Background: Evidence-based medicine (EBM) is the use of published evidence in determining patient care. Accrediting entities for medical teaching institutions require learners to demonstrate proficiency in EBM. Published evidence indicates that competency is not achieved amongst residents but does not explore medical students.
Methods: This study cross-sectional, relying on a 40-item survey disseminated via Qualtrics™. It examines relevant demographics, educational history, research experience, anticipated career trajectory, and confidence in personal EBM skill and medical school EBM curriculum; and the validated ACE tool that measures knowledge of EBM. The study has a descriptive component with primary outcome being performance on the ACE survey, a continuous variable ranging from 1-15; the secondary outcomes are (1) confidence in personal EBM skill measured as the percentage of time respondents can adequately perform EBM tasks and (2) confidence in EBM curriculum as measured by a modified Likert scale of 1-4, both being continuous. All outcomes are reported as means. The second inferential component assesses potential associations between the primary outcome and both secondary outcomes as well as between the two secondary outcomes. Correlation is measured by Pearson’s coefficient; adjusted, unadjusted simple linear regression will be performed to render coefficients, 95% confidence intervals, and p-values.
Results: Results are not yet available: survey has not yet opened due to COVID.
Conclusions: Definitive conclusions cannot be made without data. However, this study will provide definitive measure about medical student knowledge of EBM and will indicate whether more research is required to identify more effective strategies for teaching EBM.

Patient Prioritization for Proton Beam Therapy in a Cost-neutral Payer Environment: Use of the Clinical Benefit Score for Resource Allocation
Background: There has been a rapid increase in one- and two-room proton beam therapy (PBT) centers, which may limit the number of patients who can be treated with radiotherapy. The objective of this study was to analyze the impact of a ‘clinical benefit score (CBS), utilized as a method for treatment prioritization.
Methods: This study includes patients considered for PBT at a center that initially had only one or two treatment rooms available for clinical use. Patients were prospectively scored using the CBS, and higher scores were prioritized. The outcome was receipt of PBT and the independent variable was the CBS. Crude and adjusted analyses were performed using logistic regression.
Results: There were 2163 patients evaluated. A total of 205 patients (9.5%) were deemed candidates for PBT, which was received by 122 (5.6%) patients. In patients considered for PBT, the mean CBS was 18.7. Patients who were less than 21 years old, female, non-Caucasian, receiving re-irradiation, and those with Medicare had a higher CBS.
Multivariate analysis adjusting for insurance status revealed both CBS and insurance to be significant predictors for receiving PBT. A unit increase in CBS was associated with 1.04 times increased odds of receiving PBT (OR=1.04, 95%CI: 1.01-1.07, p=0.0145) and having Medicare was associated with 3.13 times increased odds of receiving PBT (OR=3.13, 95%CI: 1.57-6.26, p=0.0012).
Conclusions: The CBS utilized was significantly associated with the receipt of PBT. Physicians may consider use of the CBS as a resource allocation tool.
**Development and Application of a Prognostic Model for Oral Implant Survival: A Retrospective Cohort Study**

**Background:** Many predictors of implant survival have been studied, but a multivariable prognostic model based on time-to-event analysis has not been presented. This retrospective cohort study evaluated patients at the University of Illinois College of Dentistry, treated with oral implants from January 1, 2008 through December 31, 2019.

**Methods:** Twenty-eight candidate predictors were extracted from the College routine-care database. Twenty of these predictors were selected for inclusion in a multivariable Cox proportional hazards model, and candidates were further eliminated using a threshold of \( p = 0.25 \) initially, and \( p = 0.10 \) subsequently. Univariate analyses and Kaplan Meier survival curves were also accomplished. After testing for proportional hazards conformity, and for interactions, the final model was specified.

**Results:** Final model predictors were implant number, placement site, clinician training, placement age, sex, and an interaction between number of implants and placement site. The adjusted discrimination of the model was 0.6364, with good data fit based on a Nelson-Aalen cumulative hazard-Cox-Snell residual plot. Adjusted survival curves showed reduced survival for age greater than 57, male sex, more than 1-2 implants placed, and site other than lower anterior. Conclusion: A multivariable proportional hazards model can be developed, and used to produce adjusted survival predictions for sub-groups of patients defined according to model parameters. Study results are not indicative of causal relationships, and external model validation is required.

**Frailty Status and Post-Operative Morbidity and Mortality Among Head and Neck Cancer Patients: A Prospective Cohort Study**

**Background:** The existing literature is inconsistent for establishing the relationship between preoperative frailty status and postoperative outcomes in head and neck cancer patients. The objective of this study is to prospectively determine this association following primary surgery, using the three most widely used and validated frailty measures.

**Methods:** This is a prospective cohort study conducted at an academic tertiary care center. Adult patients over the age of 50, with a diagnosis of non-thyroid, head and neck cancer were recruited. All patients were treated with primary surgery from July 2017 to March 2020. Pre-operative frailty status was measured using the Fried Frailty Index (FFI), the Clinical Frailty Scale and the Edmonton Frail Scale (EFS). Patient age, sex, education, number of prescription medications, and prior hospitalizations were measured as independent variables. Data on mortality outcomes at 1-year, complications, institutional discharge, readmission, and tumor recurrence were measured as dependent variables.

**Results:** 100 patients were recruited to the study. A univariate analysis on preoperative patient factors found age (\( p=0.03 \)), polypharmacy (\( p < 0.0001 \)), prior hospitalization (\( p=0.001 \)) and Elixhauser comorbidity index (\( p=0.001 \)) as consistent predictors of patient frailty on the EFS. For post-operative outcomes, the FFI identified prolonged length of hospitalization (\( p=0.001 \)), readmission to hospital (\( p=0.001 \)), mortality at 1-year (\( p=0.04 \)) and recurrence (\( p=0.02 \)) were significantly associated with frailty status.

**Conclusions:** To our knowledge, this is the first study to prospectively examine the impact of frailty on post-operative outcomes. The results have significant implications for implementing prevention and rehabilitation strategies to improve post-surgical outcomes in the elderly.
### Relationship between depression and periodontitis after a self-reported physician diagnosis

**Aim:** To assess the relationship between depression and periodontitis

**Background:** Half of Americans aged 30 or older have periodontitis. Depression may be associated with the onset and progression of periodontal disease. However, to the best of knowledge, no published study has established whether the mechanisms by which stress and depression influence periodontal disease. The relationship between psychological factors/depression and periodontitis warrants further investigation because various studies have shown that psychological states can play a role in the course of chronic diseases/periodontitis. An understanding of this relationship is required for further planning in better understanding pathophysiology of periodontitis, and the aversion and treatment of periodontal disease. It is important to evaluate the association between depression and periodontal disease. Periodontitis is an infectious disease and the risk factors affecting the host and future progression.

**Methods:** Data from 1,315 obese or overweight individuals was used. Ages ranged from 40-65 years. Participants were excluded if they were pregnant, had less than four natural teeth, orthodontics, health conditions including: congenital heart disease murmurs, heart value disease, endocarditis, stroke, bleeding disorders, and active periodontal disease. Depression was self-reported (after a physician diagnosis). Clinical examinations were performed. Information gathered included: plaque index, and bleeding on probing (BOP).

**Results:** Using a logistic regression for cross-sectional data, adjusting for sex, age, revealed an odds ratio of 0.33, 95% CI (0.13, 0.67). The BOP sites were statistically significant.

**Conclusions:** Participants with depression were more likely to have periodontal disease.

### THABITI: Empowering mothers and protecting children through surgical systems strengthening

Lack of access to quality surgical care contributes to high rates of preventable deaths and disabilities especially among women and children living in resource-constrained settings such as Tanzania.

THABITI proposes to leverage Harvard’s expertise in strengthening global surgical systems and CCBRT’s expertise in providing life-changing surgical care through improving 1) access to healthcare facilities that provide surgery and anesthesia through community navigators and emergency care transport; 2) quality of healthcare through infrastructure enhancement, workforce up-skilling and continuous quality measurement and improvement; and 3) sustainable health care provision by linking communities to higher quality facilities via an innovative financing mechanism and referral model.

This comprehensive community-to-facility health system strengthening intervention has the potential to save lives, prevent disability, and rehabilitate and restore the dignity of more than one million vulnerable women and children.
Injuries associated with motorized scooters in the age of electronic scooter sharing

Background: With electric scooter (e-scooter) shares’ expansion, United States (US) cities have seen increased injuries and struggled to ensure rider and pedestrian safety. We sought to identify trends in scooter injuries before and after e-scooters’ arrival to US cities.

Methods: Using the National Electronic Injury Surveillance System (2014-2018), we identified patients injured using motorized scooters. Demographics, clinical details, and dispositions were abstracted from emergency department visits. The time trend of injuries was tested using weighted least squares and interrupted time series analysis. Univariable and multivariable analyses compared injury requiring hospital admission pre- and post-e-scooter share rollout (September 2017).

Results: This analysis includes 1,484 unweighted encounters, representing 57,906 estimated injuries involving motorized scooters nationwide. Estimates of scooter injuries have increased from 5,530 in 2014 to 16,660 in 2018 (p less than 0.001 for trend). Cases were more frequently male (57%) with a mean (SD) age of 29.7 (1.2) years. Mean injuries requiring hospitalization significantly increased (relative to pre-rollout trend) by 10.62 per month (p=0.007, 95%CI [3.09, 18.15]). Young adults (age 18-40) represented a greater proportion of injured patients post-e-scooter rollout (21% vs 35%, p=0.031). Motor vehicle (MV)-associated injuries and need for hospital admission have increased post-rollout (p less than 0.01 for both). Multivariable logistic regression of injured patients showed injury occurring post-rollout (OR 1.82, 95%CI [1.03- 3.22]) independently predicted hospital admission, controlling for age, sex, MV involvement, and race.

Conclusions: An increase in serious motorized scooter injuries coincides with e-scooter shares’ rollout in the US. Future works should explore effective polices to improve public safety.

Patient predictors for de-intensifying treatment of HPV+ oropharyngeal cancers undergoing transoral robotic surgery

Background: As risk factors and treatment trends for oropharyngeal cancers have been shifting rapidly, there is increased focus on de-escalating treatment in patients with human papillomavirus (HPV)+ tumors. However, there remains uncertainty in what types of patient predictors quantify the optimal candidate for de-escalated treatment, along with variability in the literature about which characteristics lead to treatment failure.

Methods: We conducted a retrospective analysis of overall survival in 4,445 patients with HPV+ oropharyngeal cancer who underwent trans-oral robotic surgery (TORS) between 2010-2016 using the Surveillance, Epidemiology, and End Results (SEER) Database. Secondary outcomes of cause-specific death and reason for no cancer-directed surgery were investigated in an attempt to use proxies for disease severity.

Results: Multivariable analysis found the following independent risk factors for mortality: Age greater than 80 years old (Odds Ratio [OR] 5.3, p=0.002), those who were of African American Race (OR 1.6, p=0.016), being uninsured (OR 2.2, p=0.015), having 5 or more positive lymph nodes (OR 3.1, p=0.002), having distant metastatic disease (OR 6.8, p+0.006), and having more than one primary cancer diagnosis (OR 7, p= 0.007). Protective patient characteristics included being on Medicaid when compared to those with private insurance (OR 0.79, p=0.008) and being married or common law when compared to those who were single (OR 0.11, p=0.007).

Conclusions: Patients under the age of 80 with stage I HPV+ oropharyngeal cancers who undergo surgery alone with < 5 positive lymph nodes have high overall survival. Being married and having Medicaid were found to be protective factors in this patient population.

Sport vs Assault: Mechanism of Injury Differences in Concussion among Children and Adolescents by Race and Ethnicity

Background: Concussion is a leading cause of childhood morbidity. It remains unclear how concussion mechanism of injury (MOI) differs among children and adolescents by race and ethnicity. The aim of this study was to determine if racial/ethnic differences exist in MOI among children and adolescents visiting the emergency department (ED) for concussion.
Methods: A retrospective cross-sectional analysis of child/adolescent (ages≤19) visits to the ED for concussion between years 2010-2015 using the National Hospital Ambulatory Medical Care Survey was completed. The study exposure was race/ethnicity. Main outcome measures of interest included any ED visit that resulted in a concussion diagnosis using ICD-9-CM codes 850.0-850.9, 850.11, 850.12, 959.01. MOI was categorized using ICD-9-CM E-codes. Categories included sport, motor vehicle accident, fall, assault, and other accident. Participants included 990 child/adolescent visits for concussion representing an estimated 5.1 million child/adolescent visits nationwide. By race/ethnicity, child/adolescent visits included 555 (56.1%) non-Hispanic whites, 191 (19.3%) non-Hispanic blacks, 195 (19.7%) Hispanic, and 49 (4.9%) other races and ethnicities. All analyses used Stata version 15.1 survey procedures to account for the complex sampling design. Findings were weighted to reflect population estimates.

Results: A multinomial logistic regression assessing the association of race/ethnicity and concussion MOI was statistically significant. Relative to non-Hispanic whites diagnosed with concussion, the odds of non-Hispanic black children sustaining a concussion from assault compared to sports was 4.1 (p =.007, 95% CI 1.47,11.26) after adjusting for sex and SES.

Conclusions: Amid the emergent focus of sport-related concussion, these differences underline sociodemographic differences that warrant further attention.

**Effects of socioeconomic status on incidence of cardiovascular diseases in adults >45 years of age in China**

Background: Cardiovascular diseases (CVD) are leading causes of mortality in China. Socioeconomic status (SES) has been considered as a risk factor of cardiovascular health. This study aimed to investigate the association between SES and incidence of CVD.

Methods: All data in this study were obtained from the China Health and Retirement Longitudinal Study (CHARLS) (2011, 2013 and 2015). Target population was adults aged 45+ years at recruitment. Subjects were categorized into groups according to their SES scores, which were derived through Principal Component Analysis (PCA). We examined the association between the PCA-derived SES score at baseline and physician-reported diagnosis of incident CVD in follow-up surveys, using logistic regression models. We also investigated whether the effect varies across subgroups by age, gender, smoking, alcohol use and baseline health status.

Results: 14,769 individuals were included in the study. Higher SES score (mean 0, SD 1.7, range (-3.2, 11.9) indicated higher SES status. Favorable SES status was associated with higher incidence of CVD in the univariable model (OR for positive SES group versus negative SES group: 1.39; 95% CI: 1.20, 1.21; p-value < 0.001) and multivariate model (OR: 1.28; 95% CI: 1.08, 1.21; p-value = 0.005). However, the association is not statistically significant after imputation of missing SES variables. Gender may be an effect modifier: the risk of CVD among females was higher than males, although the p-value for interaction was higher than 0.05 (p = 0.066).

Conclusions: This study shows that adults > 45 years old with favorable SES status have higher risk of CVD in China.
Regional Analysis on active surveillance for avian influenza of pandemic potential conducted in poultry population

Background: Zoonotic avian influenza is an important zoonotic disease and remains endemic within the Asia Pacific Region. As part of the EPT-2 project, FAO-supported surveillance aims to obtain a better picture on the various subtypes of avian influenza viruses circulated in the Southeast and South Asia epi-zone area. The project aims to identify common epidemiological patterns across the region as well as different epidemiological risk factors.

Methods: As part of the avian influenza active surveillance programme, oropharyngeal, cloacal and environmental samples (n=38,838) were taken from the poultry population (chickens and ducks) along the poultry value chain in five countries, namely Cambodia, Indonesia, Laos, Myanmar, Nepal and Vietnam between the flu seasons Oct 2016 to Sept 2019. The samples were tested at the national laboratories for influenza A and then further subtyped. The results were then collated by the FAORAP office.

Results: Throughout the three flu seasons under the scope of EPT-2 project, No H7N9 was detected in the five countries. There was the trend of decreased H5:H9 ratio, with decrease of samples tested positive of H5N1, but increase of samples tested positive for H5N6 and H9N2. Chickens were of the lower risk ratios of samples tested positive for H5N1 (RR= 0.58) and H5N6 (RR= 0.17) compared to ducks. However, chickens were shown to have 9.41 times the risk of samples tested positive for H9N2 than in ducks.

Conclusions: The project provides important qualitative information for future funding on animal surveillance activities in the region.

Trends and disparities in anticoagulation for atrial fibrillation in the U.S.

Background: Anticoagulation plays a critical role in preventing embolic strokes caused by atrial fibrillation. For decades, warfarin was the only oral anticoagulant. In 2011, direct oral anticoagulants (DOACs) became widely available as the preferred class of anticoagulants for most patients, but are 15 to 30 times more expensive than warfarin. This study examines the impact of DOACs on anticoagulation trends in atrial fibrillation.

Methods: Ambulatory clinic visits with a diagnosis of atrial fibrillation were analyzed using data from the U.S. National Ambulatory Medical Care Survey (NAMCS), years 2006 to 2016.

Results: From 2006 to 2016, atrial fibrillation prevalence increased from 0.76% to 1.97% among ambulatory visits. When only warfarin was available, from 2006 to 2010, there were no statistically significant differences in anticoagulation with respect to year, sex, race, depression, insurance status, physician specialty, and geography of residence. After DOACs became available, from 2011 to 2016, DOAC prescriptions rose annually, surpassing warfarin in 2016. But the overall anticoagulation prevalence remained around 53% (Ptrend = 0.73). Furthermore, the adjusted probability of DOAC use was 71% lower (95% CI 0.37-0.87) in black compared to white patients, 63% lower (95% CI 0.21-0.83) for patients with depression, and 46% lower (95% CI 0.01-0.70) for patients residing in non-metropolitan areas.

Conclusion: In atrial fibrillation, DOACs are gradually replacing warfarin as the preferred oral anticoagulant, but did not significantly affect overall anticoagulation prevalence. Moreover, possibly due to higher cost, there are significant psychosocial disparities in DOAC prescription, not previously observed when only warfarin was available.

Roses are red, Violets are blue, But do regular GP visits reduce overall healthcare utilization? For people with 3 highs and for those without too?

Background:

Most of Southeast Asia has very poor primary care infrastructure leading most health services in this region to be utilized reactively. However, regardless of geography, some specialist utilization and hospitalizations can be predictable and prevented in a general practice (GP) setting. The aim of this study is to understand GP utilization characteristics of employees at various Malaysian companies and understand how regular GP visits impacts specialist utilization and hospitalizations with patients who have the 3 highs (diabetes, hypertension, hyperlipidemia) and those who do not.
**Methods**

A cross-sectional study of claims data comprising of GP, specialist, hospitalization utilization data of employees and their dependents. The claims data was anonymized by the various companies’ human resources departments. Utilization was tracked for 3 years (2016 – 2018) for all employees and their dependents. \( n=23,393 \)

**Results:**

An increase in GP visits yielded a statistically significant reduction in specialist visits for both the 3 highs and non 3 highs populations. The greatest benefit came at 2 annual GP visits for the non 3 highs population reducing 3.1 annual specialist visits and 4 annual GP year for the 3 highs population reducing 3.4 annual specialist visits.

No statistically significant GP visits vs hospitalization utilization was found in either group.

**Conclusions:**

Regular GP visits by employees who have the 3 highs and those who do not were strongly associated with a reduction in specialist utilization.