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SUMMER RESEARCH

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Understanding the Patient Journey to Cervical, Pulmonary, and Colorectal Screening

BACKGROUND: Patient journey mapping is a methodology that seeks to understand the patient experience. Goals of patient journey mapping include identifying unmet patient needs and improved provision of quality patient care. The methodology acknowledges that the patient experience is not limited to a single health care provider or insular medical visit, but includes the events before and after a medical encounter as well as the feelings or emotions surrounding a medical event. This study uses patient journey mapping methodology to gain a deeper understanding of the barriers that patients face in accessing recommended screening for cervical, lung, and colorectal cancer after initial intervention in the emergency department and subsequent text messaging. Patient journey mapping represents a comprehensive approach for gathering details about patients' experience in order to better promote adherence to US Preventive Services Task Force recommendations in future interventions.

OBJECTIVE: The objective of this project is to identify barriers to care encountered by patients in the Emergency Department at Strong Memorial Hospital who have already enrolled in an existing study examining the efficacy of text message reminders for recommended cervical, lung and colorectal cancer screenings. Our goals include characterizing impediments to scheduling and obtaining screening, as well as identifying experiences that promote adherence to screening guidelines.

METHODS: To date, 20 participants have been recruited for the study beginning in August 2022. Interviews are recorded and transcribed through Zoom. The transcripts are then coded for themes, subthemes, and idiosyncrasies. Once data collection is completed, patient journey mapping will be used to create a visual representation of barriers to access to care across the participants' stories. Most participants have opted for phone interviews rather than Zoom due to lack of access to necessary technology.

RESULTS: This study is ongoing. Data collection will cease after approximately 10 interviews of study participants in each field (cervical, lung and colorectal cancer screenings), ideally with an even division between participants who obtained screening and participants who did not obtain screening. Preliminary findings imply patients faced difficulty obtaining screening due to the effects of the COVID-19 pandemic, lack of physician communication, and limitations of their work schedule. One of the participants spoke about how the pandemic halted her son's at-home nursing care. Caring for her son during the day and working at night prevented her from taking care of her own personal medical needs.

CONCLUSIONS: The study will build on current ongoing studies by Dr. Adler and Dr. Abar testing the efficacy of text message interventions to promote cervical, lung and colorectal cancer screenings. Our findings will be applicable to the implementation of future interventions, with the aim of informing improvements to the program in order to increase efficacy.

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In vivo imaging of immune cell activity in primate retina after photoreceptor ablation

The non-human primate (NHP) is the gold standard animal model for preclinical development of gene and cell based therapies for vision restoration. However, the ocular immune response to these interventions remains poorly understood. We conducted a proof of concept study using offset aperture adaptive optics scanning light ophthalmoscopy (AOSLO) to visualize cellular-scale changes in the primate retina following photoreceptor (PR) ablation. Offset aperture AOSLO is an advancement on previous imaging approaches as it improves the contrast on normally transparent retinal cells. Ultrafast 730nm laser exposure at 26.6 - 32.5 J/cm^2 was used to create seven lesions in four NHPs, two of which were immunosuppressed. Offset aperture images focused on retinal vascular layers were collected with an offset distance of ~10 Airy Disk Diameters from 15 minutes up to three hours after PR ablation. We observed putative immune cells in and around vessels supplying the lesioned areas. Consistent with previous findings in murine models, cells within vessels adhered to the inner wall, exhibited crawling behavior, and had a diameter ranging from ~9.3 - 11.5 µm. Additionally, we observed the emergence of cellular-scale structures above the PR layer that originated in the center of the lesion 15 minutes post-insult and gradually radiated outward. Vascular perfusion was maintained in these regions. Our data suggest that offset aperture imaging offers cellular-scale, label free, *in vivo* assessment of the retinal response to insult in NHPs and could be employed to advance our understanding of the ocular immune response provoked by disease and therapeutic interventions.

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Retinal Changes Associated with Football-Related Concussions and Head Impacts

Background:
Changes in the retina are being increasingly explored for their potential to serve as biomarkers of disease status, and these changes have been shown to reflect structural and cognitive declines associated with neuropsychiatric conditions as well as traumatic brain injury (TBI). In this pilot study, we explored the sensitivity of structural and functional retinal markers for assessing CNS sequelae of concussive and subconcussive head hits (SHH).

Methods:
Three groups of college athletes from the University of Rochester were assessed at pre-season, post-season, and a 4-month follow-up: Football players with a concussion history (n = 9), players without a concussion history (n = 11), and non-contact athletes (swimmers, track & field) (n = 12). Measures included optical coherence tomography (OCT), OCT angiography (OCTA), electroretinography, visual acuity testing (using Precision Vision EDTRS charts), and structural MRI. Head impacts during the season were tracked with in-helmet accelerometers.

Results:
Prior to the start of the season, football players with a concussive history demonstrated thicker tissue in the macula central subfield (CSF) (Hedge's g (effect size) = 1.05, p = 0.02) and the retinal nerve fiber layer (RNFL) (g = 0.81, p = 0.08), relative to both other groups, reflecting retinal changes presumably due to prior concussion history. Differences in macula CSF thickness were also observed at the end of the season (g = 1.03, p = 0.03) and 4-month follow-up (g = 1.12, p = 0.02), reflecting their non-short-term nature. Changes in RNFL only lasted until the end of the season (g = 0.93, p = 0.06). Total head impacts during the season correlated with increases in macula CSF thickness from baseline to 4-month follow-up (r = 0.53, p = 0.02). Total head impacts also correlated with increases in the foveal avascular zone area during post-season that trended toward significance ($r_s = 0.42$, p = 0.09). High intensity head impacts in particular correlated with increases in cup-to-disc ratio over the course of the season ($r_s = 0.54$, p = 0.03) and at follow-up ($r_s = 0.59$, p = 0.01).

We observed multiple relationships between occipital lobe structure at 4-month follow-up and visual acuity at various contrast levels. These included correlations with left hemisphere middle occipital gyrus thickness (at 100% contrast, $r_s = -0.35$; p = 0.06; at 2.5% contrast ($r_s = -0.41$; p = 0.03; and at 1.25% contrast ($r_s = -0.44$; p = 0.02), and with left hemisphere occipital pole thickness (at 100% contrast, $r_s = -0.41$; p = 0.03; and 2.5% contrast ($r_s = -0.37$; p = 0.05). We also observed significant correlations between visual acuity and the following right hemisphere variables: inferior occipital gyrus and sulcus thickness (at 100% contrast, r_s = -0.50; p = 0.01; at 2.5% contrast, r_s = -0.36; p = 0.05), and superior occipital gyrus thickness (at 100% contrast, r_s = -0.38; p = 0.04). Pre-season relationships between occipital lobe structure and visual acuity were similar, but weaker and in several cases no longer statistically significant.

Conclusions:
While data analysis is still ongoing, preliminary findings suggest that a history of football-related concussions are associated with retinal changes that are not short-term. Additionally, severe head impacts during a single season are associated with acute changes whose duration is not yet known. Initial MRI analysis provides evidence that relationships between occipital structure and visual acuity are stronger when the CNS has undergone some type of trauma. Further analyses will explore the association between head impacts, retinal functioning, cortical thickness, and neurocognition.

Elucidating the Mechanism of S. aureus Invasion and Colonization of the Osteocytic-Canalicular Network and Understanding the use of Bisphosphonate Conjugated Drugs to treat infection

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Staphylococcus aureus accounts for the majority of chronic osteomyelitis, which is considered to be incurable due to biofilm bacteria persisting deep within cortical bone.[1] Using transmission electron microscopy (TEM) to assess cortical bone from mice and patients with *S. aureus* osteomyelitis, we recently discovered bacterial colonization of the osteocytic lacunar-canalicular system.[2; 3] We also demonstrated that *S. aureus* 1um in diameter can propagate through a SiN nanoporous membrane in vitro. However, a major limitation of that finding is that the membranes were only 0.4um thick. Thus, the purpose of this study was to validate our in vitro transwell assay system by demonstrating *S. aureus* migration through commercially available transwell devices and to begin to understand whether bisphosphonate conjugated drugs can be used to treat these infections. Specifically, we tested the hypothesis that *S. aureus* migration is time dependent such that bacteria would propagate through the thinner SiN membranes faster than the thicker PET membranes. The SiN transwell devices were assessed for bacterial migration using colony forming units (CFU), scanning electron microscopy (SEM) of the top and bottom of the membrane, and live imaging confocal microscopy (CLSM). Bacterial migration through PET transwell devices was assessed via optical density. Results showed peak *S. aureus* migration through the SiN transwell devices is achieved between 3-6hrs, while bacterial migration through the PET transwell devices was first detected at 48hr. These findings support our hypothesis and warrant further investigation into the genes responsible for S. aureus deformation and propagation through submicron pores.

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Understanding the perspectives of Latino smokers on physical activity: A qualitative study

Introduction: Smoking and sedentarism frequently co-occur among Latinos. Evidence suggests that moderate to vigorous physical activity (MVPA) may enhance smoking cessation rates. However, this synergistic relationship has not been studied among Latinos, the largest minority group in the U.S.

Objective: To understand the perspectives of Latino smokers on physical activity.

Methods: Participants were recruited using community-based recruitment strategies. Semi-structured interviews were conducted in English and Spanish with Latino smokers. The Health Belief Model was used as a framework for qualitative theoretical analysis.

Results: At baseline, participants' mean age was 54.9 years old (SD 12.1), 50% of the participants were female, and 85% self-identified as heterosexual or straight. Eight participants (40%) indicated their language preference as "Only Spanish" and 50% were born in Cuba and Dominican Republic (25% for each country). Most participants (70%) were light smokers (1-10 cigarettes per day), 35% smoked their first cigarettes within five minutes after waking up, and 50% used menthol cigarettes. We identified perceived benefits (e.g., mood management, weight loss, strategy to quit smoking), susceptibility (e.g., risk of cardiovascular diseases and physical impairment, susceptibility to weight gain), and barriers (e.g., lack of social support, health constraints, and low financial resources) of being physically active. Moreover, we identified cues to action (e.g., being a role model: "…I'm going to do it [physical activity] so she [the daughter] can do it too…"; spending time with family and friends: "Well, since I have some little nephews and some little nieces... I go with them to the playground…"; being outdoors: "…go to the parks a lot or go nature walking… being out in the woods… taking all of nature… I would go down to Greece or Webster [New York] on my bicycle…") to doing physical activity.

Conclusion: Multiple perceived factors of being physically active were identified among Latino smokers. These factors provide concrete operational strategies to address smoking cessation and physical activity among Latinos. Further research is needed on how best to integrate these perspectives into smoking cessation interventions.

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Reaching Accuracy Assessment in Cerebellar Stroke using Virtual Reality

Objective To investigate the application of virtual reality (VR) in the rapid quantification of reaching accuracy at the bedside for patients with cerebellar stroke (CS).

Introduction Dysmetria, the inability to measure distance in muscular tasks correctly, is a characteristic clinical feature of cerebellar injury. Even though dysmetria can be quickly detected during the neurological examination with the finger-to-nose test, objective quantification of reaching accuracy for clinical assessment is still lacking. The emerging VR technology allows for the delivery of rich multisensory environmental stimuli with a high degree of control. Furthermore, recent improvements in the hand-tracking feature offer an opportunity to closely examine the speed, accuracy, and consistency of fine hand movements and proprioceptive function.

Methods 29 individuals (10 CS patients and 19 age-matched not-disabled controls) performed a task measuring reaching accuracy on the VR headset (Oculus Quest 2). During this task, the participant was asked to reach for a target placed along a sixty-degree arc in a one-dimensional plane. Once the fingertip passed through the center of the target or extended beyond the radius of the arc, the target immediately extinguised. 50% of the trials displayed a visible rendering of the hand as the participant reached for the target (visible hand condition), while the remaining 50% only showed the target being extinguished (invisible hand condition). Reaching error was calculated as the difference in degrees between where the fingertip passed the arch and where the target was positioned.

Results Reaching error was higher in CS compared to age-matched controls in both visible and invisible hand conditions. Reaching error was higher in the invisible hand condition compared to the visible hand condition in healthy controls, right CS, left CS but not in bilateral CS patients.

Average time taken to perform each trial was higher in patients than in controls in both visible and invisible hand conditions.

Discussion Reaching accuracy assessed by VR promises to be a non-invasive and rapid approach to quantifying fine motor functions in clinical settings. In addition, this device has the potential to be a useful supplemental technology in monitoring fine motor and proprioceptive functions during physical rehabilitation. Further studies are needed to examine quantitative changes in reaching accuracy during post-stroke progression.

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Flap Coverage of Infected Ventricular Assist Device Impacts Patient Outcomes

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Background: The use of ventricular assist devices (LVADs) for patients with end-stage cardiac failure awaiting heart transplantation has become increasingly common. Ventricular assist devices improve the longevity and the quality of life for these patients. In addition, they serve as a bridge to cardiac allograft transplantation until a donor heart is found. However, ventricular assist device-related infections remain a major problem complicating their long-term use. As these are life-sustaining devices, simple explanation is often difficult, or directly impossible. Clinical infection and sepsis can critically threaten these patients with ventricular assist devices. Systemic infection can delay immediate transplantation and potentially require the removal of the device for definitive treatment of the problem.

Methods: Patients who underwent insertion of a ventricular assist device and had a subsequent readmission for LVAD infection at the University of Rochester Medical Center from 2012-2022 were identified through accessing the medical records archives of the hospital. Patients were followed retrospectively for an average of 3.2 years. Review of patients' medical records was conducted to obtain patient demographics, preoperative diagnosis and disease state, type of ventricular assist device inserted, postoperative day of ventricular assist device infection onset, infectious organism identified at initial washout, infectious organism identified at time of definitive device coverage, timing of coverage procedure after the initial washout for infection, type of flap used for coverage, 90 day complications following definitive coverage and lifetime return to OR for infection. Comparison analysis with a Chi squared test was used to analyze outcomes.

Results: Of 568 patients admitted with an LVAD related infection 117 underwent operative debridement. Of these, 34 underwent primary closure, 31 underwent closure with secondary intention (NPWT with STSG), and 52 were closed with a flap (pectoralis, omental, latissimus, or

VRAM). There was a statistically significant higher incidence of RTOR for infection over a lifetime with primary closure compared to secondary intention and flap reconstruction (p=0.01,0.02), but no difference in 90 day complications (p=0.76, p=0.58). 83 patients had a positive culture upon definitive coverage with 24 having a post surgical complication, 15 of which required RTOR for infection. 34 were closed with negative cultures with 9 having a complication, and 4 requiring RTOR for infection. This was not statistically significant for complications or RTOR (p=0.79, 0.40) the culture data was further sub-stratified into bacterial cultures (n=73) vs fungal cultures (n=10) there was no statistically significant difference between these compared to complications or RTOR (p=0.40, 0.39)

Conclusion: With placement into typically systemically unwell patients with multiple co-morbidities, infections involving LVADs and their drivelines can become a devastating condition that could delay, or prevent a patient from undergoing cardiac transplantation. For patients these can also end up with prolonged hospital stays, and washout with coverage is indicated for serious infections. Coverage of these devices with loco-regional flaps or allowing to granulate using wound vac therapy with future STSG has a decreased lifetime RTOR for future infections.

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CDC opioid guidelines and its effect on controlled substance reduction between insurance types

Background:

In 2016, Centers for Disease Control and many state Medicaid programs issued guidelines for safe prescribing of long-term opioids for chronic pain and prevent opioid use disorder. The guidelines included recommendations for the duration and dose of prescriptions These guidelines play an important role in health care outcomes, access and use depending on insurance coverage. However, the national data is emerging. A study in Oregon found roughly 80% of Medicaid enrollees had their opioid prescriptions significantly tapered or discontinued after these guidelines were released. Given the opioid epidemic has disproportionately affected Medicaid enrollees it is important to monitor their outcomes. The goal of this study is to describe prescription dose changes by insurance type among patients on long-term opioids for chronic pain among patients in a primary care practice in New York State.

Methods:

An observational cohort adult of patients between 2017 and 2021. We examined changes in morphine milligram equivalents (MMEs) by insurance type.

Findings:

Ninety-six patients were included in the cohort. The cohort was predominately White (58%), female (60%) and had an average age of 58 years. Thirty-four percent were insured by Medicaid, 50% had Medicare/Advantage, 13% private and 3% other/self-pay. Overall, the mean MME at baseline was 194 and the average dose reduction was -62 MMEs (32%). The mean MME at baseline was 238 and 189 among patients with private and Medicaid insurance, respectively. Patients with private insurance had an average dose reduction 56%; whereas Medicaid was 72%.

Implications of D&I Research:

In our study, at baseline patients with private insurance were prescribed higher doses of opioids. Our findings suggest implicit bias may play a role in both baseline doses and reduction rates. Further studies are needed to determine if changes were due to insurance repayment, social determinants of health or other factors. More information is needed in order to understand how we can achieve health equity in long-term opioid prescribing policies and guidelines.

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Analyzing the Characteristics of Geographic Regions with High Racial and Ethnic Disparities in Total Joint Replacement Use

Background

Total joint replacement surgeries (TJRs), which include total hip replacements (THRs) and total knee replacements (TKRs), are highly successful surgeries for the treatment of severe osteoarthritis in these joints. However, it has been well established that significant disparities in TJR use exist such that Black and other minority groups are less likely to receive them compared to White individuals. [1-3] Notably, the use of TJRs is 38-40% lower for Black older adults compared to White older adults. Furthermore, there is significant geographic variation in the magnitude of these racial and ethnic disparities across the country. Whether the variation in these disparities can be attributed to geographic and healthcare supply factors is unknown. This knowledge can potentially inform policy that seeks to improve the equity in TJR use by addressing these factors.

Objective

Our objective is to identify potential geographic and healthcare supply mechanisms that may contribute to the lower utilization rates of TJRs by racial minority Medicare beneficiaries as compared to their White counterparts. To address this aim, we will identify factors that make one geographic region more or less susceptible to the disparity compared to another.

Methods

Datasets

We used previously calculated age- and sex-standardized rates for inpatient THRs and TKRs per 1,000 beneficiaries (separate for White and Black patients) in each of the 306 hospital referral regions (HRRs) using Medicare enrollment and claims data from 2013–2019. The Center for Medicare & Medicaid Services (CMS) removed TKRs from the Inpatient-Only (IPO) list in January 2018, so the analyses of rates for TKRs were limited to 2013–2017. We used the Agency for Healthcare Research and Quality (AHRQ)'s Social Determinants of Health (SDOH) database to obtain zipcode-level data on socioeconomic, demographic, and geographic variables. We averaged the zipcode-level data to the HRR-level using crosswalk files from the Dartmouth Atlas of Health for each year. We also used the Centers for Disease Control & Prevention (CDC) and Agency for Toxic Substances and Disease Registry's (ATSDR) Social Vulnerability Index (SVI) data and the Neighborhood Atlas from the Center for Health Disparities Research at the University of Wisconsin to obtain the Area Deprivation Index (ADI) data. The SVI and ADI data, which were obtained at the census tract and census block group, were averaged to the HRR-level using crosswalk files from the MABLE datafiles from the Missouri Census Data Center. Finally, hospital and physician capacity measures from the Dartmouth Atlas of Health were obtained at the HRR level.

Dependent Variables/Outcomes

Racial disparity in the use of THRs and TKRs was calculated as the difference in age- and sex-standardized rates between White and Black patients for a particular surgery within a HRR in a given year. For the descriptive analysis, we categorized these variables into quintiles, and for the multivariable analysis, we specified these as continuous variables. A disparity greater than zero represents the extent to which Black patients undergo fewer surgeries than White patients.

Key Independent/Explanatory Variables

The independent variables included continuous specifications of socioeconomic factors (including education, income, and employment), healthcare factors (including number of physicians per 100,000 residents and acute care hospital beds per 1,000), and demographic factors (including racial composition, English-speaking ability, and age).

Descriptive Statistical Analysis

HRRs that had at least 1% Black beneficiaries were divided into quintiles of disparity for THRs and TKRs. We calculated the means and standard deviations of normally distributed continuous variables, medians and interquartile ranges of skewed continuous variables, and frequencies and percentages of categorical variables for each disparity quintile for the baseline year. We used Kruskal-Wallis (for continuous variables) and chi-square (for categorical variables) tests to compare the distribution of the variables across disparity quintiles.

Multivariable Analysis

We used multivariable mixed-effects linear regression analyses with HRR-level random effects to examine the HRR-level disparities separately for THRs and TKRs.

Results

Descriptive Statistics

Of the 237 HRRs in the study cohort, the mean HRR-level disparity was 1.45 surgeries/1,000 beneficiaries for THR and 3.52 surgeries/1,000 beneficiaries for TKRs in 2013 (Tables 1 and 2). HRRs within the Northeast region of the US have disproportionately high rates of THR racial disparity as 25.53% of HRRs in the 5th quintile are in this region, despite making up only 13.92% of the country. Racial and ethnic disparities in TKRs, however, are found predominantly in the Midwest. The Midwest accounts for 44.68% of HRRs in the 5th quintile of TKR disparity while making up only 24.05% of HRRs.

Multivariate Regression Statistics

The averaged median household income and the percent of HRR residents that are Black were both positively associated with disparity in TJRs. For every $10,000 increase in income, disparity in THRs and TKRs increased by 0.19 (95% Confidence Interval [CI]: 0.04 to 0.34, p=0.01) and 0.36 (95% CI: 0.08 to 0.63, p=0.01), respectively. For every 1% increase in Black residents, disparity in THRs and TKRs increased by 0.02 (95% CI: 0.01 to 0.03, p=0.001) and 0.03 (95% CI: 0.01 to 0.05, p=0.001).

Conclusion

Our work identifies important geographic and healthcare predictors of racial disparities in the use of THRs and TKRs. Designing interventions that are targeted towards these markers of disparities will likely yield value in promoting the equity in joint replacement care.

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Table 1: Characteristics of HRRs separated into quintiles of racial (White/Black) disparity in THR Use in 2013*

Quintiles	1	2	3	4	5	**Total**	p-value
N	48	47	48	47	47	**237**	
Disparity in THR	-0.45 (1.50)	1.01 (0.20)	1.59 (0.17)	2.14 (0.14)	3.00 (0.55)	**1.45 (1.37)**	<.001
Overall THR Use	3.52 (0.95)	3.40 (0.84)	3.79 (0.70)	3.86 (0.77)	4.25 (0.82)	**3.76 (0.86)**	<.001
Overall THR Use-White	3.53 (0.93)	3.51 (0.79)	3.94 (0.66)	4.10 (0.69)	4.39 (0.83)	**3.89 (0.85)**	<.001
Overall THR Use-Black	3.98 (1.77)	2.50 (0.81)	2.35 (0.66)	1.95 (0.71)	1.39 (0.89)	**2.44 (1.36)**	<.001
Socioeconomic Factors							
SVI Total Flags	1.39 (0.55)	1.55 (0.86)	1.43 (0.64)	1.37 (0.63)	1.32 (0.57)	**1.41 (0.66)**	.50
ADI National Rank	65.20 (14.63)	64.11 (13.9)	56.52 (17.63)	50.24 (19.17)	48.44 (21.62)	**56.93 (18.77)**	<.001
Gini coefficient	0.42 (0.02)	0.43 (0.02)	0.42 (0.02)	0.43 (0.03)	0.42 (0.03)	**0.42 (0.02)**	.21
Median Household Income	46280.75 (10536.61)	45647.16 (7391.39)	53854.28 (13405.33)	57346.14 (17506.80)	59913.01 (17254.35)	**52586.83 (14816.23)**	<.001
% Less than High School Education	16.80 (4.78)	17.66 (5.13)	14.80 (4.02)	13.63 (4.13)	13.92 (5.35)	**15.37 (4.94)**	<.001
% Unemployed	10.50 (2.42)	10.67 (2.63)	10.52 (2.41)	9.97 (2.58)	9.70 (2.16)	**10.28 (2.45)**	.31
Healthcare Factors							
Orthopaedic Surgeons per 100,000	6.12 (1.22)	5.91 (0.84)	6.12 (1.19)	6.35 (1.02)	6.39 (1.10)	**6.18 (1.09)**	.13
Primary Care Physicians per 100,000	67.19 (10.46)	68.17 (10.84)	70.51 (11.12)	73.97 (11.09)	73.53 (14.50)	**70.66 (11.91)**	.02
Acute Care Hospital Beds per 1,000	2.37 (0.48)	2.40 (0.60)	2.15 (0.50)	2.12 (0.54)	1.99 (0.46)	**2.21 (0.54)**	<.001
Beneficiary Characteristics							
% Above 65	16.52 (3.99)	15.59 (2.71)	15.35 (3.00)	15.27 (2.72)	16.20 (4.33)	**15.79 (3.43)**	.47
% Female	50.34 (1.22)	50.46 (1.19)	50.14 (1.01)	50.21 (0.94)	50.27 (0.94)	**50.28 (1.06)**	.50
% Black	6.98 (7.24)	11.07 (8.84)	9.04 (7.25)	10.34 (9.25)	4.40 (3.12)	**8.36 (7.78)**	<.001
% Foreign Born	5.78 (5.97)	6.31 (6.91)	8.44 (6.91)	10.75 (9.20)	12.41 (9.15)	**8.72 (8.08)**	<.001
% Limited English Households	2.11 (2.91)	2.56 (3.32)	2.95 (2.79)	3.42 (3.54)	4.28 (3.45)	**3.06 (3.27)**	<.001
Geographic Characteristics							
Region							.02
Northeast: N (%)	2 (4.17)	3 (6.38)	9 (18.75)	7 (14.89)	12 (25.53)	**33 (13.92)**	
South: N (%)	30 (64.58)	30 (63.83)	18 (37.50)	22 (46.81)	14 (29.79)	**115 (48.52)**	
Midwest: N (%)	8 (16.67)	10 (21.28)	14 (29.17)	13 (27.66)	12 (25.53)	**57 (24.05)**	
West: N (%)	7 (14.58)	4 (8.51)	7 (14.58)	5 (10.64)	9 (19.15)	**32 (13.50)**	
Total Weighted Population	12465.14 (7168.68)	13127.17 (8092.15)	15443.38 (7916.22)	16386.69 (7313.55)	16252.80 (8731.46)	**14728.45 (7964.35)**	.01
Primary Rural-Urban Commuting Area Codes (2010)	3.48 (1.66)	3.64 (1.46)	2.91 (1.42)	2.78 (1.56)	2.88 (1.81)	**3.14 (1.61)**	.02

*ADI, SVI, and Dartmouth Data used years 2015, 2014, and 2011, respectively

Table 2: Characteristics of HRRs separated into quintiles of racial (White/Black) disparity in TKR Use in 2013*

Quintiles	1	2	3	4	5	**Total**	p-value
N	48	47	48	47	47	**237**	
Disparity in TKR	0.65 (1.50)	2.66 (0.40)	3.74 (0.26)	4.61 (0.23)	5.99 (1.14)	**3.52 (2.01)**	<.001
Overall TKR Use	8.43 (2.19)	8.55 (1.69)	9.11 (1.42)	9.44 (1.19)	9.99 (1.12)	**9.10 (1.67)**	<.001
Overall TKR Use-White	8.50 (2.12)	8.79 (1.63)	9.46 (1.33)	9.94 (1.07)	10.50 (1.00)	**9.43 (1.65)**	<.001
Overall TKR Use-Black	7.84 (3.06)	6.13 (1.74)	5.72 (1.37)	5.32 (1.06)	4.51 (1.50)	**5.91 (2.17)**	<.001
Socioeconomic Factors							
SVI Total Flags	1.56 (0.98)	1.47 (0.60)	1.37 (0.55)	1.36 (0.50)	1.29 (0.53)	**1.41 (0.66)**	.68
ADI National Rank	49.92 (23.66)	54.89 (20.15)	54.54 (17.14)	62.06 (15.98)	63.46 (11.95)	**56.93 (18.77)**	.02
Gini coefficient	0.42 (0.03)	0.42 (0.02)	0.43 (0.02)	0.43 (0.02)	0.42 (0.02)	**0.42 (0.02)**	.49
Median Household Income	56922.21 (18439.38)	54766.58 (16591.55)	52763.83 (14666.55)	49743.63 (12413.71)	48641.87 (9000.57)	**52586.83 (14816.23)**	.22
% Less than High School Education	15.25 (5.52)	15.51 (5.31)	15.11 (4.53)	15.88 (4.43)	15.09 (4.95)	**15.37 (4.94)**	.74
% Unemployed	9.68 (2.62)	10.38 (2.50)	10.87 (1.96)	10.09 (2.51)	10.36 (2.57)	**10.28 (2.45)**	.13
Healthcare Factors							
Orthopaedic Surgeons per 100,000	5.94 (1.10)	6.36 (1.08)	6.39 (0.90)	6.02 (0.96)	6.20 (1.32)	**6.18 (1.09)**	.09
Primary Care Physicians per 100,000	72.02 (14.61)	71.39 (11.34)	70.4 (12.52)	69.04 (10.96)	70.42 (9.75)	**70.66 (11.91)**	.59
Acute Care Hospital Beds per 1,000	2.10 (0.54)	2.20 (0.51)	2.04 (0.52)	2.37 (0.50)	2.33 (0.55)	**2.21 (0.54)**	.004
Beneficiary Characteristics							
% Above 65	16.72 (4.71)	15.33 (3.08)	15.63 (3.05)	15.25 (2.05)	16 (3.59)	**15.79 (3.43)**	.52
% Female	50.19 (1.27)	50.53 (0.99)	50.14 (0.98)	50.18 (0.87)	50.39 (1.15)	**50.28 (1.06)**	.39
% Black	5.54 (6.70)	8.23 (8.18)	9.12 (8.17)	10.36 (7.63)	8.6 (7.65)	**8.36 (7.78)**	.002
% Foreign Born	13.58 (11.19)	9.29 (8.38)	8.56 (6.46)	6.85 (5.95)	5.22 (4.16)	**8.72 (8.08)**	.001
% Limited English Households	5.01 (4.69)	3.18 (3.28)	2.79 (2.50)	2.49 (2.31)	1.81 (2.00)	**3.06 (3.27)**	.003
Geographic Characteristics							
Region							<.001
Northeast: N (%)	11 (22.92)	10 (21.28)	7 (14.58)	2 (4.26)	3 (6.38)	**33 (13.92)**	
South: N (%)	19 (39.58)	23 (48.94)	24 (50.00)	28 (59.57)	21 (44.68)	**115 (48.52)**	
Midwest: N (%)	5 (10.42)	8 (17.02)	8 (16.67)	15 (31.91)	21 (44.68)	**57 (24.05)**	
West: N (%)	13 (27.08)	6 (12.77)	9 (18.75)	2 (4.26)	2 (4.26)	**32 (13.50)**	
Total Weighted Population	16880.26 (10497.11)	15584.50 (8753.87)	15395.63 (6212.82)	13298.99 (7045.6)	12422.88 (5793.99)	**14728.45 (7964.35)**	.09
Primary Rural-Urban Commuting Area Codes (2010)	3.00 (1.69)	2.83 (1.57)	2.73 (1.33)	3.50 (1.63)	3.64 (1.66)	**3.14 (1.61)**	.01

*ADI, SVI, and Dartmouth Data used years 2015, 2014, and 2011, respectively

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Title: Leveraging the Electronic Health Record to Decrease Unnecessary Overnight Vital Signs and Neuro Checks in the Inpatient Setting

Introduction:

Inpatients have shorter, more interrupted sleep than at home, which is associated with worse health outcomes[1]. CPOE default orders for vital signs and neurological examinations frequently disturb inpatient sleep[2]. Vital signs and neuro checks are performed throughout the night, regardless of the patient's acuity, and reducing these frequencies may improve patient sleep quality without introducing clinical risk[3]. We investigated nightly disturbances due to vital signs and neuro checks, modified clinical decision support in these orders, and evaluated the effectiveness of these modifications in combination with sleep-friendly education. The purpose of this abstract is to understand the EHR order defaults that frequently disrupt sleep, specifically related to neuro checks and vital signs assessments, and discuss several approaches to reduce sleep disruptions secondary to these defaults.

Methods:

Baseline: We surveyed patients and staff in an inpatient neurology unit (INU) at an academic medical center (AMC) about sleep disruptions. Our team chose this unit because of the importance of sleep in neurological patients' recovery and the staff's enthusiasm to participate. Patients aged 18 years or older that stayed for at least one night on the INU were included. We excluded patients with acute illness, severe cognitive impairment, or severe aphasia.
CDS modifications: Staff identified vital signs and neuro checks as top sleep disruptors for inpatients on the unit. The quick buttons included one time, q4 hours, qshift, and daily. Interprofessional stakeholders agreed upon adding two quick buttons to vital signs and neuro checks orders: q4 hour while awake and TID. Qshift (0800, 1600, 2400) was removed. The default to q4 hours was unchanged.
Education: We held educational sessions targeted at around-the-clock EHR defaults with residents, hospitalists, nurses, and patient care technicians.
Secure Chat: Using EHR secure chat messaging, we sent afternoon messages to covering providers on the unit, reminding them to review vital signs and neuro checks orders, and modify them to sleep-friendly orders if appropriate.
Statistical analysis: We defined the pre-implementation period as May 2021 to October 2021 and the post-implementation period from December 2021 to May 2022, excluding November 2021 as a wash-out period, since CDS changes went live in early November, and the EHR secure chat initiative went live in mid-November. Using Epic Clarity, we calculated total neuro checks and total vital signs causing sleep disruptions. We defined sleep disruptions as neuro checks and vital

signs performed between 11 pm and 7 am. We used this timeframe based on inpatient surveys showing average sleep onset and wake times of 10:35 pm and 6:55 am. Continuous data were analyzed pre- and post-implementation using paired t-tests and interrupted time-series analysis using R version 4.1.2.

Results:

Survey response rates for staff and patients were 84%, and 43%, respectively. Nurses ranked vital signs as very disruptive or extremely disruptive to sleep at a slightly higher rate than providers (60% vs. 54%, p=.34). Qualitative survey comments and subsequent focus groups identified neuro checks as problematic as well. Interrupted time series analysis revealed that in the six months after CDS changes and secure chat launch, sleep disruptions secondary to neuro checks across the AMC and INU decreased significantly (AMC: pre-intervention monthly average: 56,663 post-intervention monthly average: 46,705, Change in intercept: -17%, CI: [-20%, -13%], p = 0.001; INU: pre-intervention monthly average: 3,909 post-intervention monthly average: 2,376, Change in intercept: -35%, CI: [-53%, -18%], p = 0.001). Similarly, the number of nightly disturbances due to vital signs across the AMC and INU decreased significantly in the post-intervention period: (AMC: pre-intervention monthly average: 355,922 post-intervention monthly average: 315,379, Change in intercept: -11%, CI: [-17%, -5%], p = 0.001; INU: Pre-intervention monthly average: 4,317 post-intervention monthly average: 2,272, Change in intercept: -45%, CI: [-65%, -25%], p = 0.001). Patient reported number of awakenings, neuro checks disturbance ratings, and vital signs disturbance ratings did not significantly change pre- and post- intervention.

Conclusion:

Changes to quick buttons and provider education decreased the objective number of nightly disturbances due to both neuro checks and vital signs at the AMC and INU. Although our data shows that nightly disturbances secondary to neuro checks and vital signs decreased, subjective sleep did not improve in the INU. These differences highlight the need to evaluate additional around-the-clock interventions commonly bundled with neuro checks and vital signs, and to align workflows with prioritizing sleep. The objective decrease in vital signs and neuro checks nightly disturbances represents progress in terms of promoting sleep-friendly culture and re-evaluating long-accepted order frequencies. Continuing to identify interventions causing unnecessary sleep disturbances on inpatient units and safely introducing modifications through EHR and education will thus hopefully improve sleep outcomes.

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A Potential Role Interpretative Services in Controlled Substance Safety Committees

The implementation of Multidisciplinary Controlled Substance Safety Committees (CSSC) in primary care can help promote safe prescribing among patients on long-term controlled substances. While, CSSCs often consist of several types of health care clinicians, language support services are not often included. Studies have shown Hispanic, deaf and hard of hearing populations often lack culturally appropriate translation services that allow for effective opioid treatment. The goal of this study is to describe treatment outcomes among patients prescribed long-term opioids and who prefer to speak a language other than English (LOTE). We used EHR data from 2017-2021 to describe patients reviewed by a primary care CSSC that had non-malignant chronic pain and were prescribed a controlled medication ≥ 90 MMEs for ≥ 90 days. We examined whether they had a follow-up visit and any changes in opioid dosing. We stratified findings by patients' preferred language.

At baseline 497 patients were reviewed by the CSSC and 16 (3%) preferred to use a LOTE. LOTE included Spanish (n=11), American Sign Language (n=2), Laotian (n=1), Maay (n=1) and Nepali (n=1). Overall, 19% (96/497) had a follow up visit, of which 1% (5/497) were LOTE. Dose changes among those that spoke primarily English, and a LOTE were 95% (91/96) and 60% (3/5), respectively. Our findings suggest we need more information on retention and treatment changes for patients that speak LOTE. While the implementation of CSSCs shows promise, future studies should further examine equity of implementation among those who speak LOTE.

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Orthorexia Nervosa: An Updated Review of the Literature and Directions for Future Research

Introduction: A condition known as orthorexia nervosa (OrNe), or a pathological desire to consume “healthy” foods, has gained increasing attention since Dr. Steven Bratman originally suggested the existence of the phenomenon in 1997. At the time, Dr. Bratman suggested that OrNe was characterized by a “fixation on righteous eating.” Since then, various studies have been conducted to analyze demographics, behaviors and attitudes, diagnostic tools, and treatment plans associated with OrNe. Despite this, much speculation has remained in the scientific communities surrounding whether the condition is unique or pathological enough in contrast to other psychological, feeding, and eating disorders to be recognized as an official diagnosis in future editions of the Diagnostic and Statistical Manuals of Psychological Disorders (DSM).

A previous mixed methods study was conducted in 2020 to determine the state of the current OrNe research, knowledge of OrNe among healthcare professionals, and gaps in OrNe research, education, and diagnostic efforts. Results determined that research done on OrNe up to 2019 was scant, practitioners in family medicine/primary care exhibited significantly less knowledge of OrNe as compared to other healthcare fields, and that 95% of interviewed professionals felt there were gaps in the way OrNe is clinically/medically addressed including lack of reliable research, diagnostic tools, and treatment methods for the condition, unawareness of the condition among healthcare professionals, and encouragement of orthorexic behaviors by medical providers.

The initial study results inspired a follow up study to analyze how OrNe and other feeding and eating disorders are addressed in primary care settings from the perspective of patients as stakeholders. Since 2019, the research on OrNe has more than doubled, therefore, given the increase in attention that OrNe is receiving, it was imperative to do an updated review of the topic considering the previously documented gaps in the literature.

Methods: A collection of 40 peer-reviewed journal articles from 2019 to 2022 were selected for review based on the criteria that they both included the terms “orthorexia nervosa” or “orthorexic behavior” in their titles and were written or available in English. The updated literature was compared to that of the previous literature review from 2020. By analyzing if any

advancements have been made on the topic of OrNe in the last three years, this updated review may inform future translational research on OrNe.

Results: Although the amount of available research on OrNe has more than doubled in the last three years, the research on the topic has remained limited. More recent literature has further defined OrNe, recognizing its possible bidimensional nature and suggesting manifestations of OrNe may be pathological or non-pathological. However, continued lack of official diagnostic criteria and validated assessment tools has limited researchers and clinicians in their ability to assess the prevalence of, diagnose, treat, and manage related symptomatology.

Discussion: Given the comorbidities associated with eating and feeding disorders, and the increasing interest in health and well-being among the public, it is imperative that additional research on the topic be completed, and reliable diagnostic tools be created, tested, and then translated into the clinical setting. Therefore, the updated literature review confirms the necessity of analyzing patient experience to inform future clinical practices. While more research has been done on the topic in recent years, such data is of little help if it is not utilized at the bedside.

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Assessment of Sports Nutrition Knowledge in Collegiate Athletes

Background

Appropriate nutrition is particularly important for collegiate student-athletes who need to fuel themselves to excel both academically and athletically. It has been well established that adequate nutrition can enhance an athlete's performance and recovery (Karpinski, 2019). Despite this, studies have shown that student-athletes have low sports nutrition knowledge (Andrews, 2016). This nutrition knowledge gap may put many student-athletes at risk of sub-maximal academic and athletic performance. The aim of this pilot study was to assess the nutritional knowledge of a sample of student-athletes at The State University of New York (SUNY) at Brockport, a National Collegiate Athletic Association (NCAA) Division III program.

Methods

The 49-Item Sports Nutrition Knowledge Instrument (49-SNKI) was utilized for assessing nutrition knowledge, as it was created and validated specifically for use in collegiate athletes (Karpinski, 2019). In order to reduce survey burden, the study team piloted a shortened, 15-item version of the SNKI, selecting a subset of questions from each theme represented in the full 49-SNKI. Themes included carbohydrates, protein, fat, hydration, micronutrients, and weight management. This survey was administered to SUNY Brockport student-athletes at mandatory compliance meetings with the team physician. Poll Everywhere was used to administer the survey in an effort to facilitate an interactive session. However, the limitations of this method of survey administration (as discussed in the Limitations section) outweighed the benefits and a paper survey format will be adopted for future administration of the survey.

Results

As of August 22, 2022, 333 student-athletes completed the survey. Analyses will be conducted on 296 athletes due to exclusions. Two hundred and five (69.3%) of the respondents were from men's teams (cross country, football, and soccer). Ninety-one (30.7%) were from women's teams (cross country, field hockey, soccer, and volleyball). At present, the men's average score on the nutrition assessment is 74.9% while the women's average score is 78.5%. Data collection will continue through October 27, 2022.

Conclusion

This was a pilot study conducted on collegiate athletes to assess their nutritional knowledge. Feasibility and acceptance of survey items was established. However, limitations (as discussed in the Limitations section) have been encountered. These limitations have led to iterative changes in the study's survey collection methodology. The second phase of the pilot study will continue this fall. Future steps will involve validation of this short-form measure and more in-depth statistical analysis of the pilot data.

Limitations

Limitations were encountered during survey administration. One limitation of Poll Everywhere is a varying participation rate per question, in part, due to irregular durations of time for response submission. Additionally, as these sessions are meant to be informative and educational, the correct answer was discussed after the administration of each question. The discussions of previous questions may have influenced a student-athlete's responses for the questions to follow. Thus the survey, delivered in this format, is not an accurate indication of the athlete's baseline nutrition knowledge. Also, these discussions surrounding survey questions were not held constant amongst the three pre-season compliance meetings for which the Poll Everywhere format was utilized introducing response bias. While we will not be able to draw overarching conclusions, it will be interesting to compare results between the two methods of survey distribution.

Citations

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Identifying Non-Invasive Neurophysiologic Biomarkers to Optimize Deep Brain Stimulation Therapy for Treatment of Dystonia

Background and Objective:
Dystonia is a movement disorder where involuntary muscle contractions lead to atypical, often painful, and functionally disruptive slow movements or postures. Current treatments are limited, as medications and botulinum toxin injections are costly, can have unpleasant side effects, and do not provide sufficient symptom relief for many patients. Deep brain stimulation (DBS) is a treatment option for refractory dystonia, although it can take months to optimize settings and is not effective for everyone. Better methods are needed to identify potential candidates for DBS surgery and treatment, as well as improve DBS programming efficiency.

Studies have demonstrated promise for the use of electroencephalography (EEG) as a noninvasive tool for identifying brain activity unique to dystonia. However, these studies have not explored how EEG characteristics change over the course of months, despite that it often takes weeks to months to see clinically meaningful changes in dystonia symptoms. We hypothesize that sufficiently chronic EEG studies will reveal unique EEG signal characteristics that correlate with dystonia symptom severity. Such signal characteristics could inform DBS programming and selection of DBS candidates. The goal of this pilot study is to determine important recording locations and time points that should be used in larger studies.

Methods:
We collected data from patients receiving globus pallidus pars internus (GPi) DBS as treatment for isolated dystonia, acquired dystonia, or Parkinson Disease (PD) (control subjects). Subjects were enrolled prior to surgery through 3 months post-surgery. A 128-channel high-density EEG system was used to collect scalp EEG recordings during rest or volitional finger movements. Symptom videos and symptom surveys were used to assess dystonia symptom severity over time. Data were high-pass filtered at 1 Hz to remove drift artifact, and then custom MATLAB routines were written to analyze data.

Results:
We enrolled and collected data from 5 subjects with an average age of 55.4 years +/- a standard deviation of 14.6 years, including four males and one female. Two subjects had PD (one of which also had dystonia), two had isolated dystonia, and one had cerebral palsy with acquired dystonia. We will compare mean peak frequency and log power spectral density of EEG activity across frequencies with physiological relevance and determine the most prominent cortical location(s) where unique and significant signal characteristics are identified. Correlations between patterns of EEG activity over time and symptom severity will be calculated for each patient.

Discussion:
Results from this pilot study will pave the way for future studies by determining which EEG recording locations and time points are most useful. Future studies with larger sample sizes are needed to better characterize the correlation between EEG characteristics and dystonia symptoms. Non-invasive biomarkers of dystonia measured with EEG may help predict which patients will respond favorably to DBS, potentially expanding who is offered DBS therapy and preventing unnecessary surgery when the potential benefit is low.

The Extent that Morbid Obesity is a Modifiable Risk Factor Among Morbidly Obese Patients with Joint Osteoarthritis without Participating in a Formal Perioperative Optimization Program

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INTRODUCTION: Morbid obesity is thought to be a modifiable risk factor prior to lower extremity joint replacement; however, little data exists in support of this commonly accepted hypothesis. Our purpose is to evaluate the extent to which morbid obesity is a modifiable risk factor in patients with hip or knee osteoarthritis without a perioperative optimization program. By examining patients with a body mass index (BMI) > 40 at initial presentation for consultation regarding lower extremity joint replacement, we have determined: 1) the percentage of patients who achieved BMI < 40 over a two year study period through nutritional modification or bariatric surgery; 2) the number of patients who were eligible for total knee arthroplasty (TKA) based on arthritis severity who ultimately undergo the procedure within two years; 3) differences in patient reported outcome measures (PROMs) in patients who achieved weight loss goals versus those that did not.

METHODS: This is a single-institution retrospective analysis of 624 morbidly obese patients that were evaluated for TKA between 1/1/2016 and 12/31/2019. The inclusion criteria: symptomatic Kellgren-Lawrence grade 3 or 4 radiographic knee osteoarthritis, age 18-95, BMI> 40, and follow-up within 1 year of initial visit (N=624). In-addition to demographic data, the type of weight loss intervention, maximum BMI change, and PROMs scores from initial and final visits were collected. Multivariant logistic regression models used for joint replacement surgery, and max BMI change > cutoffs outcomes. Multivariant linear regression models used for max BMI change, and PROMIS score outcomes. Categorical variables were compared using chi-squared tests, whereas continuous variables compared using Kruskal-Wallis tests.

RESULTS SECTION: Patients who pursued bariatric surgery were younger than those who pursued non-surgical intervention and those who pursued no weight loss intervention (mean age [standard deviation]: 52.61 [9.51] versus 57.05 [9.61] versus 58.11 [9.95]; p-value= .0002, respectively) (Table 1). Length of follow-up was also longer in patients pursuing bariatric surgery versus non-surgical intervention and no intervention (mean length in months [standard deviation]: 55.85 [35.12] versus 54.42 [32.5] versus 35.14 [33.56]; p-value< .0001, respectively) (Table 1). Those who underwent bariatric surgery had mean maximum BMI change of -3.25 [10.64] compared to non-surgical interventions -2.63 [6.22] and no intervention 0.41 [4.22] (p<.0001) (Table 1). The percentage of patients that experienced BMI loss of greater than 10 were as follows: bariatric surgery (23.75%, N=19), non-surgical intervention (8.61%, N=21), and no intervention (1.0%, N=3); (p=.0006). Additionally, patients that experienced maximum BMI loss of between 5 and 10 were: bariatric surgery (38.75%, N=31), non-surgical intervention (27.05%, N=66), and no intervention (6.0%, N=18); (p<.0001) (Table 1).

Amongst patients who underwent bariatric surgery, 16.25% (N=13) underwent joint replacement, compared to 15.16% (N=37) of patients who utilized non-surgical interventions and 6.33% (N=19) of those who did not pursue weight loss intervention (p-value=.0043) (Table 1). Bariatric surgery patients were 3.075 times more likely to undergo TKA compared to no intervention (95% CI [1.338, 7.064]; p-value= .008), while non-surgical intervention patients were 2.419 times more likely to undergo TKA compared to no intervention (95% CI [1.288, 4.544]; p-value=.006) (Table 1).

Also, surgical intervention patients were 23.624 times more likely to lose 10 or more BMI compared to no intervention (95% CI [6.299, 88.596]; p-value<.0001), whereas non-surgical intervention group was 6.425 times more likely to lose 10 or more BMI compared to no intervention (95% CI [1.805, 22.879]; p-value= .004). Surgical intervention group was 3.677 times more likely to lose 10 or more BMI compared to non-surgical intervention participants (95% CI [1.666, 8.113]; p-value=.001). When the same two groups are compared, bariatric surgery group was 1.959 times more likely to experience loss of 5 to 10 BMI compared to non-surgical intervention (95% CI [1.060, 3.623]; p-value=.032) (Table 1).Surgical intervention group was also 8.784 times likely to experience reduction of BMI by 5 to 10 compared to no intervention (95% CI [4.188, 18.423]; p-value< .001), while non-surgical intervention group was 4.483 times more likely to lose 5-10 BMI compared to no intervention (95% CI [2.449, 8.208; p-value<.001) (Table 1). Lastly, white patients across all interventions were 2.32 times more likely to experience loss of greater than 5 BMI compared to non-white patients (95% CI [.231, .869]; p-value=.018) (Table 1). PROMIS analysis revealed no significant difference in pain or physical function outcomes when comparing bariatric surgery vs. non-surgical and bariatric surgery vs. no intervention.

DISCUSSION: Patients who underwent bariatric surgery versus no intervention were more likely to lose weight and to subsequently undergo joint replacement. Those who required a loss of 10 BMI prior to TKA were vastly more successful through bariatric surgery compared to no intervention and non-surgical intervention; therefore in these patients it is essential to discuss the value to bariatric surgery to achieve the weight loss goal.

SIGNIFICANCE/CLINICAL RELEVANCE: Patients had similar PROMs scores after TKA regardless of weight loss method. Obese patients requiring loss of >10 BMI are vastly more successful through utilization of bariatric surgery compared to non-surgical interventions; and thus, bariatric surgery should be considered as a first-choice option in such cases. Further study is required to elucidate the benefits and risks of recommending bariatric surgery as a first choice for weight loss prior to TKA.

IMAGES AND TABLES

Table 1

Intervention type	***No Intervention***	***Non-Surgical Intervention***	***Surgical Intervention***	***Total***	***P-Value***
Age (Mean (SD))	58.11(9.9)	57.05(9.6)	52.61(9.5)	56.99(9.9)	p <0.0001
Length of Follow-up (Mean (SD))	35.14 (33.5)	54.42(32.5)	55.85(35.1)	45.33(34.7)	p <0.0001
Joint Replacement Surgery (N (%))					p=0.0043
No surgery	281 (93.6)	207(84.8)	67(83.7)	555(88.9)	
Surgery	19 (6.3)	37(15.1)	13(16.2)	69(11.0)	
Max BMI change (Mean (SD))	0.41(4.2)	-2.63(6.2)	-3.25(10.6)	-1.36(6.4)	p <0.0001
Max BMI change (N (%))					p=0.0006
>= -10	239 (79.7)	208(85.2)	54(67.5)	501(80.3)	
< -10	3(1.0)	21(8.6)	19(23.7)	43(6.8)	
Max BMI change (N (%))					p <0.0001
>= -5	224 (74.7)	163(66.8)	42(52.5)	429(68.7)	
< -5	18 (6.0)	66(27.0)	31(38.7)	115(18.4)	
Max BMI change (N (%))					p <0.0001
>= 0	141(47.0)	72(29.5)	28(35.0)	241(38.6)	
< 0	101 (33.6)	157(64.3)	45(56.2)	303(48.5)	

Table 2: Weight loss intervention recommendation based on desired BMI reduction prior to TKA

BMI Reduction Necessary for Joint Replacement	Odds of BMI Loss Through Bariatric Surgery v. Non-Surgical Interventions (diet, counseling, etc.)	Recommendation
Greater than 10	3.667 (95% CI [1.666, 8.113]; p-value=.001).	Much more likely to succeed through bariatric surgery, should consider as first choice weight loss method depending on individual risk factors
Between 5 and 10	1.959 (95% CI [1.060, 3.623]; p-value=.032)	Bariatric surgery more successful, but strict lifestyle changes should be attempted first
Between 0 and 5	0.881 (95% CI [.487, 1.594]; p-value=.676)	Equivalent results, lifestyle change should be first choice

Guy, Diamond

Preceptor
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Preventing Arthritis in a Multi-Center Psoriasis At-Risk Cohort (PAMPA) Study

Introduction and Background

Psoriatic arthritis (PsA) is a chronic immune-mediated inflammatory disease that affects approximately 2 million people in the United States. PsA is a common sequela that affects one-third of patients with psoriasis (PsO)[1], resulting in widespread inflammatory arthritis in the peripheral joints[2]. Given the approximate onset window of developing PsA is 5–7 years[3], the concept of early intervention will be the central focus of our clinical trial as we are recruiting patients with PsO at high risk for PsA. We believe early intervention during this transition from PsO to PsA can prevent or delay these poor outcomes. In the case of PsA, identifying patients at high risk for PsA is difficult as there is limited understanding of the cellular and molecular mechanisms underlying the transition from PsO to PsA.

Goals of the study:

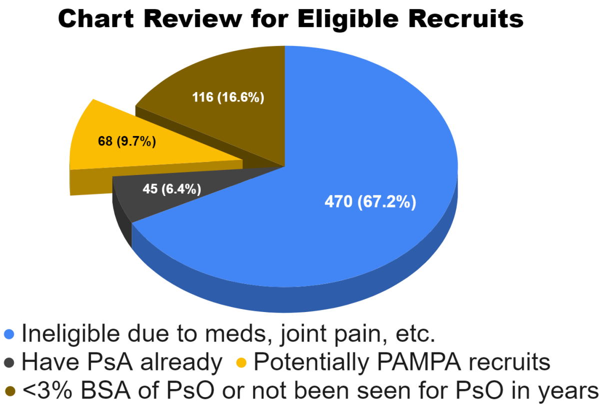
Our goals are to recruit and treat participants' PsO with a safe FDA-approved IL-23 inhibitor to prevent/delay PsA. In addition to determining if ultrasound findings are predictive tools for PsA and can aid in identifying subjects of patients at high risk for PsA.

Methods

- This study is a double-blind; randomized; placebo control; wait-list design. The estimated sample size is 350 high-risk psoriasis patients. Arms 1: 100 participants will receive the new drug, Arm 2: 100 participants will receive a placebo, and Arm 3: 150 participants will not receive treatment (controls). Participants will attend 8 visits over a two-year reporting time frame.
- Continuous recruitment of eligible participants from UR Medicine Dermatology clinics and the CTSI database via the electronic medical record of patients with established or new PsO at high risk of developing PsA.
- Screening requirements for participants: obtain a musculoskeletal power doppler ultrasound (MSKPDUS) composite score of bilateral synovitis and enthesitis, Body Surface Area, Investigator's Global Assessment modified 2011, Blood draws, and Skin swabs.

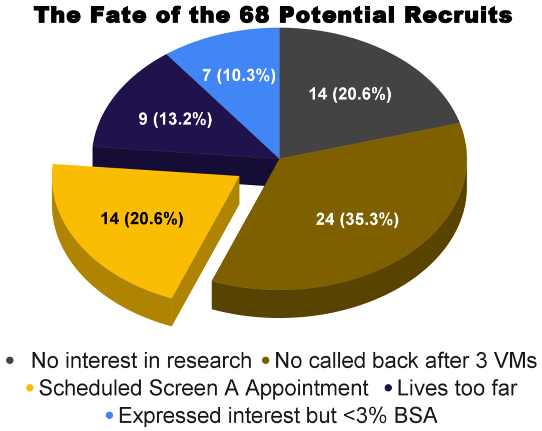
Results:

This summer, I analyzed roughly 700 patient charts in search of eligible participants to recruit. Below are the results of recruitment and enrollment:



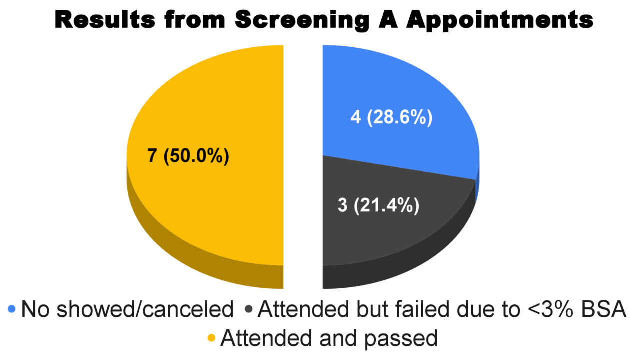
A.

Figure A. 470 were ineligible due to meds, age, joint pain, cancer, etc. 45 have PsA. 116 had <3% BSA of PsO or have not been seen for PsO in years. 68 were deemed as potential recruits.



B.

Figure B. 24 never called back/answered after 3 VM over 3 weeks. 10 needed follow-up calls. 9 live too far away from our site (URMC). 13 expressed no interest in research. 6 expressed interest but had <3% BSA. 14 scheduled Screening A appointments.



C.

Figure C. 7 attended and passed Screen A appointment. 4 no-showed/canceled. 3 attended but failed Screen A appointment due to <3% BSA.

D.

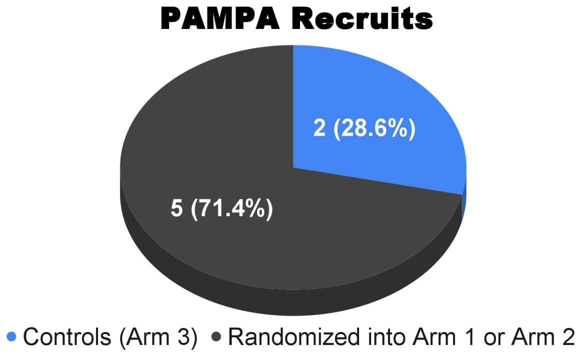


Figure D. 7 recruits passed both Screen A and B appointments. Two of which are controls and the other five will be randomized into Arm 1 or 2.

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Samantha Marie Helmy

Non-invasive Cerebral Blood Flow and Oxygenation Monitoring in Adults undergoing Extracorporeal Membrane Oxygenation

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OBJECTIVE: The longitudinal goal of this study is to develop the use of non-invasive multi-modal neuromonitoring including optical, ultrasonic, and electrophysiological modalities to identify markers of neurologic injury occurring in the setting of extracorporeal membrane oxygenation (ECMO) among inpatient adults, and to predict neurologic outcome.

This observational study particularly focuses on hemodynamic parameters measured by diffuse optical methods, alongside Transcranial Doppler ultrasound and electroencephalography.

BACKGROUND

Extracorporeal membrane oxygenation (ECMO) is a machine used to provide cardiac and respiratory support for patients in acute cardiogenic shock and/or respiratory failure. By continuously removing blood, oxygenating it in an external gas chamber, and returning it into the circulatory system through either a venovenous (VV) or venoartieral (VA) system, ECMO is a life-saving technology for cardiogenic shock patients [1]. While these efforts sustain function of a person's cardiopulmonary system, little information is known about the level of cerebral perfusion, leaving patients susceptible to anoxic brain injury.

With a percentage of patients on ECMO placed in a medically-induced coma, clinicians are even more limited about a patient's degree of neurological function due to the inability to perform a neurologic physical exam. Among adults placed on VA ECMO after suffering a cardiac event, 15% are reported to suffer from brain injuries. Approximately 30% of those brain injuries result from ischemic strokes and up to 40% are intracerebral hemorrhages, leaving this population vulnerable to neurological cognitive impairment [2,3,4]. Studies have shown significantly compromised cognition in patients undergoing VA ECMO as a result [5]. There is a gap in understanding the events leading up to neuronal dysfunction for patients on ECMO, largely due to the limited knowledge about amount and distribution of cerebral blood flow.

As there are currently no validated cerebral monitoring procedures, our goal is to study cerebral blood flow, electrical function, and long-term neurocognitive outcomes using a combination of non-invasive neuromonitoring techniques among adults on ECMO to establish monitoring parameters and correlate them with the functional outcomes [6]. Such parameters include the use of a transcranial doppler (TCD), electroencephalography (EEG) and diffuse correlative spectroscopy (DCS) over the duration of ECMO. GCS and FOUR scores are continuously taken during admission while GOSE and TICS scores are evaluated 3 months, 6 months, and 12 months after hospital discharge to better understand long term cognitive function.

DCS is a diffuse optical method that utilizes near-infrared light sources that penetrate deep into tissue and reports microvascular parameters, including tissue blood oxygen saturation (StO2) and cerebral blood flow. Studies have validated the correlation DCS measurements to related changes in cerebral blood flow. We hope to reflect this correlation by quantifying patients' cerebral metabolic rate of oxygen (CMRO2) which is indicative of neuronal functionality and health [7].

The results of this long-term study can serve to inform clinicians of the adequacy of brain perfusion and oxygenation for patients on ECMO. This would lead to more targeted care to maximize patients' cognitive outcomes after ECMO therapy.

Results to be included in the poster as new data is still being conducted and this study will continue for the duration of the next 2-3 years.

CONCLUSIONS: The combined use of DCS and quantitative EEG holds promise as a noninvasive, continuous, multimodal indictor of hypoxic brain injury for patients on ECMO.

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Summer Research Abstract: Tim Hoang

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Investigation of chest radiograph and computed tomography scan landmarks to predict Impella device Positioning and concordance with echocardiogram findings

Introduction: The Impella device is an important catheter-based miniaturized ventricular assist device that is currently used as one of the potential treatments for left ventricular (LV) heart failure [1]. The use of this device serves as a minimally invasive intervention for treatment of LV failure due to its placement into the heart via retrograde femoral artery access. The Impella device is often placed in cardiology catheterization labs where predominately echocardiography can be used to evaluate optimal positioning [2]. However, up to 30% of ICU patients have been found to not have an adequate acoustic window for viewing of optimal Impella placement on TTE due to lung pathology, intubation, or distention during mechanical ventilation [3,4]. This can lead to poor decision making and hampered echocardiographic assessment for ICU patients possibly suffering from malpositioned cardiac devices such as Impella.

Objective: The goal of this study is to identify anatomic landmarks that are useful for predicting functional positioning of the Impella device on Chest X-ray (CXR) and Computed tomography scans (CT).

Methods: This is a Retrospective study of patients who have undergone Chest X-ray (CXR), computed tomography scans (CT), and echocardiography after Impella implantation. We were provided access to the radiology information system (RIS) to identify subjects who have undergone CXR, CT, and echocardiography from Jan 1st, 2014, to Jan 5th, 2022, upon our Institutional Review Board (IRB) submission. Patient's electronic medical record (EMR) were also assessed to note findings at the time of the nonsurgical intervention. Records from about 500 patients were reviewed, from which 104 patients were obtained after meeting the inclusion criteria. Philips Intellispace Portal was used to compute distance measurements from various anatomical landmarks on the different imaging modalities. Unpaired T-tests were used to identify statistically significant differences in anatomical measurements between patients that did or did not have their Impella devices repositioned, with logistic regression used to identify predictors of repositioning. Intraclass correlation coefficients were computed to identify concordance of the same anatomical measurements among different imaging modalities.

Results: Within the CT imaging modality, the distance between the carina to aortic valve plane was significantly larger in the Impella repositioned group (N=14) compared to the non-repositioned group (N=90) ($p=0.013$). There was also a significant difference in the distance between aortic valve plane to Impella inlet distance ($p=0.023$). There were no significant differences in the measurements found between the Impella repositioned and non-repositioned group in the CXR modality. Intraclass correlation coefficients showed significant concordance in the aortic arch to carina measurement between CT and CXR ($p<0.0001$) and Scout and CXR ($p=0.012$). In addition, significant concordance was found between the aortic arch to Impella outlet distance in scout and CXR ($p=0.032$), the carina to

Impella outlet distance in scout and CXR (p<0.0001), and the aortic valve plane to Impella inlet distance in CT and central line (p<0.0001).

Conclusion: CT scans may prove useful in providing another imaging modality for assessing the positioning of the Impella device within patients. There was a significant difference in distance of the carina to aortic valve plane and distance of aortic valve plane to Impella inlet between patients that had to have their Impella device be repositioned and those that had proper placement. Chest radiographs were unable to identify statistically significant landmarks to distinguish between the repositioned and non-repositioned groups indicating that this imaging modality may still serve challenges in providing diagnostic findings. The imaging agreement studies suggest that there could be predictive models for measurements across imaging modalities that may provide useful information for clinicians.

Table 1:

Imaging Characteristics

Measure	Repositioned (n=14)	Not Repositioned (n=90)	P value*
*CT^*			
Aortic Arch to Carina	46.3±5.99	51.3±11	p=0.27
Aortic Arch to Aortic Valve Plane	128±17.8	119±15.9	p=0.18
Carina to Aortic Valve Plane	81.5±14.2	67.4±13.1	**p=0.013**
Aortic Valve Plane to Impella Inlet	22.5±25.6	36.3±13.2	**p=0.023**
Scout			
Aortic Arch to Carina	41.2±6.28	41.1±8.62	p=0.94
Aortic Arch to Impella Outlet	45.2±12.1	44±16	p=0.79
Carina to Impella Outlet	3.7±13.1	3.59±14.1	p=0.98
CXR			
Aortic Arch to Carina (canula)	25.8±11	27.6±11.2	p=0.59
Aortic Arch to Carina (vessel)	49.3±8.54	47.5±10.2	p=0.53
Aortic Arch to Impella Outlet	61.7±19.3	58.8±21.7	p=0.65
Carina to Impella Outlet	12.5±22.4	11.1±19.8	p=0.81
Angle of Inlet and Outlet Valve	125±21.3	122±16.8	p=0.58
Central Line			
Aortic Valve to Aortic Arch	115±16.3	115±14	p=0.94
Aortic Valve to Inlet	37.2±20.7	39.3±13	p=0.61
Categorical			
Contrast (% Yes)	n=1/14 [7.14% (0.181-33.9%)]	n=7/89 [7.87% (3.22-15.5%)]	p>0.99

Placement Type (% Femoral)	n=12/14 [85.7% (57.2-98.2%)]	n=77/90 [85.6% (76.6-92.1%)]	p>0.99
Catheter Position (% Bottom)	n=12/12 [100% (73.5-100%)]	n=54/77 [70.1% (58.6-80%)]	**p=0.032**

^ Note: These exclude 8 cases where CT was performed after re-positioning

* Repositioned vs. not repositioned

Table 2:

Imaging Modality Agreement

Measure	Imaging Modality 1	Imaging Modality 2	Intraclass Correlation Coefficient*	Bland-Altman Bias† (first column – second column)
Aortic Arch to Carina	CT	Scout (vessel)	0.48(-0.0948-0.777, p=0.074)	10.2(-3.25-23.7, **p<0.0001**)
	CT	CXR (canula)	0.16(-0.0702-0.449, p=0.18)	23.9(2.59-45.1, **p<0.0001**)
	CT	CXR (vessel)	0.62(0.426-0.747, **p<0.0001**)	3.83(-13-20.7, **p<0.0001**)
	Scout (vessel)	CXR (canula)	0.3(-0.099-0.611, p=0.11)	13.8(-3.99-31.5, **p<0.0001**)
	Scout (vessel)	CXR (vessel)	0.57(0.0767-0.785, **p=0.012**)	-6.48(-20.2-7.19, **p<0.0001**)
	CXR (canula)	CXR (vessel)	0.26(-0.0558-0.618, p=0.16)	-20.6(-35.5--5.77, **p<0.0001**)
Aortic Arch to Impella Outlet	Scout	CXR	0.6(-0.0297-0.83, **p=0.032**)	-14.7(-38.7-9.36, **p<0.0001**)
Carina to Impella Outlet	Scout	CXR	0.68(0.405-0.819, **p<0.0001**)	-7.62(-31.6-16.4, **p<0.0001**)
Aortic Valve Plane to Impella Inlet	CT	Central Line	0.9(0.815-0.938, **p<0.0001**)	-2.68(-14.5-9.18, **p<0.0001**)

* Two-way random model for absolute agreement, p value is testing against theoretical mean of 0

† Bias is calculated as Imaging Modality 1 – Imaging Modality 2, p value is testing against theoretical mean of 0

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Mentor: Dr. Isaac Schmale
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Student Name: Minjoo Jo (M2)

Title: Shared Decision Making for Patients with Nasal Polyposis: Needs Assessment

Background:
The management of nasal polyposis has become increasingly complex in recent years, with no single clear best treatment option or algorithm for any specific patient. As such, treating nasal polyposis naturally involves shared decision making between patients and providers. However, to date very little is known regarding patient attitudes and preferences regarding treatment counseling and how they would prefer to be involved in decision making. This study aims to investigate patient and provider perceived needs relating to nasal polyposis treatment decisions.

Methods:
Phase I of this multi-phase study was focused on needs assessments of three groups: 1. Nasal polyposis patients who had been diagnosed but have not made their treatment decision (pre-decision group); 2. Nasal polyposis patients who had made their decision and undergone treatment (post-decision group); and 3. Providers who routinely diagnose and treat nasal polyposis patients. Surveys were conducted either through phone calls or online. Common responses and themed responses were analyzed.

Results:
Eight patients were interviewed from June, 2022 to August, 2022. One patient was interviewed prior to making medical decisions (pre-decision group) for their nasal polyposis, and seven patients were interviewed after making decisions (post-decision group). Among the post-treatment group, one patient chose biologics and six patients chose surgery. The main/most important patient-perceived benefit of all treatment options (surgery, biologics, nasal rinses with steroids, and oral steroids) was symptom relief. The advantage associated specifically with biologics was the possibility of not undergoing endoscopic sinus surgery, nasal steroid rinses and/or oral steroids as well as an impression of easy administration with less invasiveness. The perceived risks associated with surgery that patients cited as important were: longer recovery time and the possibility of surgical complications such as bleeding. Where patients cited concerns regarding the relative “newness” of biologics and associated risks especially long term risks being relatively unknown.
One provider responded to our needs assessment. The provider is a practicing otolaryngologist who had concerns about the time constraint of nasal polyposis appointments as a challenge for effective and/or complete treatment counseling. What the provider perceived as barriers to patients’ informed decision making included: patients' understanding of each treatment option, cost of treatments, potential adverse effects of medications, and surgical complications associated with patients' comorbidity. Finally, the perceived cause of patients’ dissatisfaction with their decisions was the recurrence of nasal polyposis after the treatment.

Conclusion:
Both patients and the provider believed that a shared decision making process was important for nasal polyposis care. The provider stated that an informational handout with treatment options would be helpful in better counseling nasal polyposis patients. Overall, patients felt that their providers helped support their decisions as opposed to guiding them only to one option. Patients also stated that their physicians provided the information they needed to make the final decision. The incorporation of written information as a patient decision aid including all treatment options for nasal polyposis, and risks and benefits associated with each treatment, could help patients in future well-designed trials looking at shared decision making outcomes for nasal polyposis patients.

Jones, Brooke

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Research Remote

Assessing Women's Lived Experiences and Quality of Life After mTBI: A Mixed-Methods Assessment

Background:

Mild traumatic brain injury (mTBI) is one of the leading causes of death and disability globally. An increasing number of women are affected by mTBIs/ concussions and their long-term outcomes tend to be worse than men's.

Objective:

There is limited research on the lived experiences of women who have sustained mTBIs. The overall goal of this project was to utilize a mixed-methods approach to better understand the lived experiences of women and their quality of life after sustaining a mild traumatic brain injury.

Methods:

A survey including demographic questions, open-ended questions for qualitative data, and the 36-Item Short Form Survey (SF-36) for quantitative data were posted in several Facebook mTBI/concussion support groups on 6/20/2022. Within a 24-hour period, 20 completed responses were obtained. We allowed an additional 14 completed responses to be obtained to ensure data saturation.

From the data collected, we created clusters based on the qualitative data, and from those clusters, we then compared the clusters' SF-36 averages. The four clusters reflect the most common daily disturbances women with mTBIs reported– Cognitive Disruptions, Sensory Disruptions, Pain, and Inability to Work. For each cluster, we found the average SF-36 Physical functioning score and average SF-36 Role Limitations due to Physical Health Scores. The collected SF-36 data reflect the respondent's current level of physical functioning and how limited they feel they are due to physical health concerns. A higher SF-36 survey score (0-100) defines a more favorable health state.

Results:

Cognitive Disruptions:
22 participants (64.7%) reported experiencing Cognitive Disruptions. The **average SF-36 Physical Functioning Score** was **58** while the **average SF-36 Role Limitations due to Physical Health score** was **17**.

Sensory Disruptions:
21 participants (61.8%) reported experiencing Sensory Disruptions. The **average SF-36 Physical Functioning Score** was **60** while the **average SF-36 Role Limitations due to Physical Health score** was **25**.

Pain:
17 participants (50%) reported pain. The **average SF-36 Physical Functioning Score** was **51** while the **average SF-36 Role Limitations due to Physical Health score was 25**.

Inability to Work:
15 participants (44%) reported an inability to work due to symptoms of their mTBI. The **average SF-36 Physical Functioning Score** was **48** while the **Role Limitations due to Physical Health score** was **5**.

Other themes found: Mood changes, Relationship Effects, Isolation, Fatigue, and Incontinence.

Conclusion:

mTBIs occurring as long ago as 8 years, tremendously impact the lived experiences and quality of life of women. Based on the SF-36 data obtained, the inability to work causes the most profound impact on the quality of life of women who have sustained a mTBI. Women who reported an inability to work showed a lower SF-36 Physical Functioning score as well as dramatically lower Role Limitations due to Physical Health score when compared to respondents in other clusters. Therefore, respondents included in the inability to work cluster feel that the symptoms of their mTBIs are so severe, it interferes with their ability to adequately perform their job responsibilities. An inability to work also affects independence, livelihood, finances, and more. This data, as a collective, calls for more thorough, supportive care in which the symptoms and psychosocial concerns of mTBIs in women are better addressed.

Lander, Alex[1]

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Patient-Reported Outcomes Measurement Information System (PROMIS) for Emergency Department (ED) Application Feasibility Study

Introduction: The Patient-Reported Outcomes Measurement Information System (PROMIS) is widely used in clinical practice and in research and has been well validated for risk stratification and monitoring of longitudinal patient outcomes. Implementation of PROMIS in the emergency department (ED) setting is novel and has the ability to improve patient care through the identification of potentially high-risk patient populations. While PROMIS metrics are routinely collected for clinical purposes and quality assurance throughout other departments at University of Rochester (UR) Medicine, the use of PROMIS in the ED has not been rigorously studied at the University of Rochester or other institutions.

Purpose: This study aimed to determine the feasibility of implementing the collection of PROMIS in the Strong Memorial Hospital ED and to identify correlates of PROMIS scores in an ED patient population.

Methods: We conducted a prospective observational feasibility study with patients presenting the Strong Memorial Hospital for care between July 22nd and August 30th. Eligible patients were those with decisional capacity to consent, of non-emergent clinical acuity, used English as their primary language, and 18 years of age or older. The study team identified patients by screening the electronic medical record for eligibility and then through consultation with the Emergency Department Project Associate (EDRA) Program. Patients were approached and consented via a paper information letter. If consent was given, the patient was enrolled in the study and asked to complete a short survey. A web-based HIPPA-compliant database was developed using Research Electronic Data Capture (REDCap). Data were collected using the computer-adaptive version of the following PROMIS measures: Global Health, Pain Interference, Physical Function, and Depression. In addition, the survey included demographic questions. A standardized medical record abstraction was conducted on all patients and entered into a linked database. The primary outcome of the study included feasibility metrics including: 1) number of approached and consented subjects; 2) time to complete each of the PROMIS instruments; 3) PROMIS scores; and 4) correlates of PROMIS scores.

Results: 150 patients were identified with, 86 patients approached, 64 patients enrolled, and 63 survey completions. The mean age of the sample was 51.64 (18.07) and 48.4% were of male gender. The acuity levels enrolled were 12 (21%) level 2, 45 (72.6%) level 3, 3 (4.8%) level 4, and 1 (1.6%) level 5. Of the enrolled patients, 54 (84.4%) were located in the Observational unit.

The average State Area Deprivation index was 8.06 (1.74) with a National Area Deprivation Index average of 60.21 (20.96). The patients on average had 1.33 (1.94) ED visits in the prior 6 months to their enrollment date.

Regarding the PROMIS measures, only 1 out of 64 subjects were unable to complete all of the computer-adaptive assessments. The majority of patients were able to complete each of the computer-adaptive PROMIS measures in under three minutes. For the PROMIS global health, the majority of patients indicated their overall health to be Good (39.7%) or Fair (28.6%). Mean and corresponding standard deviation scores on the PROMIS measures were as follows: 1) Physical Function: 41.45 (9.41); 2) Pain Interference: 62.83 (8.58); and 3) Depression: 53.01 (8.85).

Conclusions: The results suggest PROMIS is feasible for implementation in the ED setting. Through the use of the computer-adaptive PROMIS, each of the PROMIS measures were completed in under three minutes for the majority of patients, with only 1 enrolled patient unable to complete the survey, indicating the ease and efficiency of implementing the survey. Since many enrolled individuals were located in the observational wing of the ED, which other medical centers may not have, the generatability of the study to an acute care setting may be limited.

POSTER TITLE: Resolution of Hyperandrogenism, Insulin Resistance and Acanthosis Nigricans (HAIR-AN) Syndrome After Sleeve Gastrectomy: A Case Report

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DISCLOSURE SUMMARY: The authors have no conflicts of interest

ABSTRACT

Hyperandrogenism, insulin resistance, and acanthosis nigricans (HAIR-AN) is a severe sub-phenotype of polycystic ovary syndrome (PCOS). Androgen excess disorders, mainly polycystic ovary syndrome (PCOS), affect approximately 10% of women of childbearing age and increase the risks of many comorbidities including type 2 diabetes, cardiovascular disease, obstructive sleep apnea and others. Patients with HAIR-AN present with severe insulin resistance, in addition to features of PCOS (oligo- or amenorrhea secondary to oligo- or anovulation, clinical and/or biochemical hyperandrogenism and polycystic ovarian morphology). While some degree of insulin resistance occurs in most cases of PCOS [1], the extreme severity of insulin resistance in HAIR-AN, believed to be due to genetic defects in the insulin signaling pathway [2, 3], leads to manifestations of acanthosis nigricans and central obesity. A 32-year-old woman with HAIR-AN and class 3 obesity presented to an endocrinology clinic after she failed treatment with metformin, estrogen-progestin OCP, spironolactone, leuprolide and levonorgestrel intra-uterine device. She complained of hirsutism and acanthosis nigricans severely affecting her quality of life and had secondary amenorrhea. Laboratory evaluation showed extremely elevated testosterone and insulin levels and elevated hemoglobin A1C. She underwent laparoscopic sleeve gastrectomy. One year after the surgery, she lost 32% of her body weight and reported normalization of menses, dramatic improvement in hirsutism and near-resolution of acanthosis nigricans. Her testosterone, insulin, and hemoglobin A1C normalized. This case demonstrates the central role of hyperinsulinema in HAIR-AN and suggests that aggressive measures to normalize insulin resistance and reduce excess weight can effectively treat the reproductive abnormalities in this syndrome. We suggest that bariatric surgery can be an effective cure for HAIR-AN syndrome and that PCOS, including HAIR-AN, should be considered a comorbidity of obesity during evaluation of bariatric surgery candidates.

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Exploring the Prevalence of Chronic Pain in ADHD Populations

Background

In 2016, the CDC released guidelines for safer opioid prescribing for chronic pain and estimated that 20.4% of adults experience chronic pain. However, the prevalence of chronic pain among those with ADHD is largely unexplored. This is important given ADHD, chronic pain can coexist and can both be managed with controlled substances. The goal of this study was to describe ADHD diagnoses among patients in a safety-net primary care practice diagnosed with chronic pain.

Methods

We reviewed electronic health records of patients seen in a primary care practice between 2018-2021 and were prescribed a C-II - CV drug class for ≥ 90 days. We identified patients with concurrent ADHD and chronic pain diagnoses. The resulting subset of patients was then characterized in terms of age, sex, and race demographics.

Results

We identified 5100 patients between 2018-2021. Six hundred forty-three had ADHD diagnoses and were prescribed a controlled substance. Of these, 169 of them (26.2%) also had chronic pain. This population was primarily female (63.3%) and 37.7% were male. The average combined age was 41 years old (42 for females and 39 for males). Most of these patients were White (83%); 8% were Black or African American; 4% were Other; 2% were Unknown; and less than 1% each were Asian, Korean, Cambodian, and American Indian or Alaskan Native.

Conclusion

Further investigation should be conducted to understand if these findings hold in a larger sample. Furthermore, our findings underscore the importance of exploring if implementation treatment guidelines should be tailored to meet the challenges of patients with co-occurring conditions.

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The Impact of Nutritional Counseling on Growth Velocity in Pediatric IBD Patients

Introduction:

Approximately 1 in 4 patients with inflammatory bowel disease (IBD) will present with the disease during childhood (1). Pediatric IBD is linked to poor growth outcomes and pubertal delay in both Crohn's disease (CD) and ulcerative colitis (UC), which are the two major forms of IBD (2). In fact, in up to 46% of pediatric CD patients, a decrease in height velocity is the first symptom to present, before any hallmark gastrointestinal symptoms (2). This decreased growth is likely multifactorial and related to factors such as decreased caloric intake, poor nutrient absorption, corticosteroid use, and chronic inflammation requiring increased energy expenditure.

In up to 17% of pediatric IBD patients with decreased growth velocity, these early delays can lead to a permanent growth deficit (3). Avoiding growth delay is thus a critical issue in the field of pediatric IBD, and there is increasing research being done to identify best practices to improve growth velocity. This study aimed to assess the effectiveness of nutritional counseling by a registered dietician on growth velocity in the pediatric IBD population at a major medical center. The nutritional counselling group was compared to a control group of pediatric IBD patients that did not receive this nutritional counseling.

Methods:

This study was conducted as a retrospective chart review. Charts of pediatric IBD patients that were seen at Golisano Children's Hospital at the University of Rochester, Rochester, NY in the years 2020 and 2021 were collected using billing codes. 140 total charts were pulled and reviewed, and 7 were excluded because they did not have an established IBD diagnosis. Of the remaining 133 charts, the following data were collected:

<u>Demographic Data</u>

1. Biological Sex
2. Current Age
3. Diagnosis
4. Age at diagnosis

Growth Chart Data

5. Height velocity (cm/month) in the 18 months after diagnosis
6. Weight velocity (kg/month) in the 18 months after diagnosis
7. BMI velocity (kg*month/m^2) in the in the 18 months after diagnosis

The example below displays how the calculations for height, weight, and BMI velocity were performed:

$$Height\ Velocity\ in\ the\ 18\ months\ after\ Diagnosis = \frac{Height\ (cm)\ 18\ months\ after\ Diagnosis - Height\ (cm)\ at\ Diagnosis}{18\ months}$$

Laboratory Data

8. Vitamin D levels at diagnosis
9. Calcium levels (mg/dL) at diagnosis
10. Albumin levels (g/dL) at diagnosis
11. C-reactive protein (mg/L) levels at diagnosis
12. Erythrocyte sedimentation rate (mm/hr) levels at diagnosis
13. Hemoglobin levels (g/dL) at diagnosis

Results:

Of the pediatric IBD population sampled 56% of patients were male, 44% were female, and the mean age of diagnosis was 11.2 years (SD = 3.74). Most patients were diagnosed with Crohn's disease (77%) and ulcerative colitis (18%). 40.60% of patients had had at least one appointment or consultation with a dietician or a nutritionist, while 59.40% had not met with a dietician or a nutritionist.

The mean height velocity in the 18 months after diagnosis was 0.31 cm/month (SD = 0.35 cm/month), the mean weight velocity in the 18 months after diagnosis was 0.63 kg/month (SD = 0.57 kg/month), and the mean BMI velocity in the 18 months after diagnosis was 0.18 kg*month/m^2 (SD = 0.22 kg*month/m^2). In terms of height velocity in the 18 months post diagnosis, there was no significant difference between those who had dietary consultations and those who did not (t(125)=0.02, p=0.99). Those who received a dietary consultation had a significantly higher weight velocity in the 18 months post diagnosis (t(125)=1.86, p=0.03). The mean weight velocity for patients who received dietary consult was 0.7 kg/month (SD = 0.07) as compared to 0.54 kg/month (SD = 0.07) for patients who did not receive dietary consultation.

Conclusions:

These results suggest that consultation with a dietician or nutritionist has a significant effect on the growth potential, specifically the weight gain potential, of pediatric IBD patients. We did not see a significant increase in the height velocity, which may be due to the pre/early pubertal mean age of our data. Extended follow-up may demonstrate a different result as the weight gains are often associated with height gains during puberty. Further multivariate analyses of the laboratory data that was collected are ongoing and may help to identify if any of the laboratory tests are strong predictors of growth or delay in growth. This could then allow physicians to identify patients that are at higher risk of poor growth outcomes and design more targeted interventions for these high-risk patients.

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Analysis of Appendectomy Enhanced Recovery After Surgery (ERAS) Antibiotic Therapy Protocol Quality Improvement Project

Enhanced Recovery After Surgery (ERAS) protocols are readily implemented for elective surgical procedures and have demonstrated improved patient outcomes such as reduced surgical site infection, decreased length of stay, and reduced readmissions. The impact of implementing ERAS protocols for urgent procedures, including appendectomy, on patient specific outcomes and changes in antibiotic use/antibiotic-associated outcomes has not yet been fully established. Considering the increase and severity of antimicrobial resistance, using the narrowest spectrum antibiotic possible while still optimally targeting the likely pathogens and minimizing risk of infectious complications is a crucial goal when treating patients with acute appendicitis.

The University of Rochester Medical Center appendectomy ERAS guideline was officially implemented in June 2021 as a quality improvement (QI) initiative, with a final order set available in December 2021. This guideline recommends that patients receive intravenous (IV) ceftriaxone and metronidazole starting at time of diagnosis or admission continuing until at least time of surgery. For patients who do not receive treatment-based antibiotics prior to surgery, intraoperative cefazolin and metronidazole are recommended prior to incision. For patients with severe cephalosporin allergies, ertapenem IV is recommended rather than the cephalosporin/metronidazole combination.

We analyzed antibiotic selection for 886 adult patients presenting with acute appendicitis requiring urgent appendectomy at Strong Memorial Hospital between January 1, 2019 and May 31, 2022, to evaluate adherence to antibiotic recommendations of ERAS QI protocol guidelines, identify patterns in guideline deviation, and assure balance measures were not negatively impacted. Data was gathered through the National Surgery Quality Improvement Program (NSQIP) and from the electronic medical record.

Preliminary results indicate that adherence to ERAS protocol guidelines has led to a reduction in broad spectrum antibiotic use in emergent appendectomy procedures without an apparent increase in surgical site infections or readmissions.

Title: Retinal Biomarkers as Predictors of Cognition and Depression in Medically Complex Patients

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Introduction:

Ophthalmological measurements are increasingly studied as biomarkers of neuropsychiatric disorders. Like the cerebellum and thalamus of the brain, retina tissue is embryologically derived from the primitive forebrain vesicles and is an extension of the central nervous system that is easily accessible to examination. Devices including optical coherence tomography without (OCT), or with angiography (OCTA) give high-resolution retinal imaging of nerve and vessel layers in seconds. Electroretinography (ERG) measures electrical activity of the retina, also in seconds.

As described by Silverstein et al. (2020), retinal changes have been found in wide ranging neurocognitive conditions from Alzheimer disease to autism, schizophrenia and mood disorders[1,2].
Cognitive impairment has been correlated with smaller ERG amplitudes and peak times[3,4].

Presented here is preliminary data analysis from an ongoing study examining retinal biomarkers as predictors of neuropsychiatric changes in two control groups of adults with advanced stage heart failure (AHF) or with non-proliferative diabetic retinopathy (NPDR), both of which are known to have neuropsychiatric sequelae.

Examining retinal structure and function markers with neuropsychiatric findings in medically complex patients begins to expand the use of ophthalmologic biomarkers to a more diverse group of patients.

Methods and Materials:

We analyzed baseline data from an ongoing study examining retinal biomarkers as predictors of neuropsychiatric changes for both AHF and NPDR groups combined. Inclusion criteria: adults over age 18, English-speaking with medical condition of heart failure per the New York Heart Association II-IV, or NPDR with a stable HbA1c level.
Exclusion criteria consisted of a history of delirium, stroke, or neurocognitive disorder. Patients with retinal disease and seizure disorder were also excluded.
We used Spearman rho correlations to determine the association between Montreal Cognitive Assessment (MoCA), Beck Depression Inventory (BDI)-7, and Generalized Anxiety Disorder (GAD)-7 scores, and OCT, OCTA and ERG exam measurements.
Ophthalmological measurements are reported as an average of right and left eyes.

Results

The analysis included 28 subjects with an average age = 61.8; female = 7.
Mean assessment scores were: GAD-7 (6.00±6.25), BDI-7 (3.57±3.53), MoCA (23.75±4.26). Significant correlations were observed between total MoCA scores and photopic negative response (PhNR) amplitude (Spearman $\rho = -0.51$, $p = 0.007$), flicker amplitude at 72 ms (Spearman $\rho = 0.394$, $p = 0.042$), and macula central subfield thickness (Spearman $\rho = 0.384$, $p = 0.048$). BDI-7 score was significantly correlated with retinal nerve fiber layer (Spearman $\rho = -.415$, $p = 0.031$). There were no significant correlations between OCTA and neuropsychological measurements, and GAD-7 did not show significant correlation with ophthalmologic measurements.

Discussion:

Cognitive impairment (lower MoCA score) was correlated with abnormal retinal electrical activity (lower ERG flicker amplitude, smaller photopic negative response (PhNR) amplitude). This finding suggests that impaired cognition is associated with lower levels of electrical potentials in photoreceptors and bipolar cells, and attenuated activity of retinal ganglion cells respectively.
Depressive mood (higher BDI-7 item score) was correlated with smaller retinal nerve fiber layer thickness. This finding indicates a possible degenerative process in the retina, and therefore in the greater CNS, may be associated with depression.
These findings are consistent with existing literature [1,2,3,4].

Conclusions:

Retinal structure and function may be linked to cognitive decline and depressed mood, and this relationship can be seen even in medically more complex patients. Larger, prospective studies are needed to confirm the findings of this small, pilot study.

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Early recovery following robot assisted and kinematically aligned total knee arthroplasty compared to traditional mechanical alignment technique

Introduction:

Robotic instruments are increasingly being used in total knee arthroplasty (TKA). Novel, second-generation robots do not require a pre-operative CT scan and instead use other target mapping methods for navigation during surgery. Adoption of robotics has allowed knee surgeons a new level of precision and facilitates the adoption of a more kinematic approach to knee replacement. Unlike traditional techniques, kinematic robotic methods allow for varying degrees of varus and valgus knee joint alignment, better matching individual patients' pre-arthritic anatomic variations. In this study, we sought to examine one surgeon's transition from traditional mechanical alignment technique to a modified kinematic approach by comparing their robotic TKA patient outcomes with those from previous, traditionally instrumented TKAs.

Methods:

We examined 6-week post operative data from 102 traditionally instrumented, mechanically aligned and 66 kinematically aligned robotic TKA subjects from January 2021-October 2021 and October 2021-April 2022, respectively. TKAs that were revisions of previous surgery, or the result of traumatic injury were excluded from the final sample. Both groups used the same implant design. Variables examined included patient demographics, range of motion (ROM), pain levels, use of assistive devices, postoperative complications such as infections and hospital readmissions, KOOSJR knee scores, and surgical logistics such as tourniquet times.

Results:

Robotic and traditionally instrumented TKAs did not differ significantly in any of the functional status outcome measures (pain scores, use of assistive devices, ROM), however these variables trended toward better outcomes with robotic instrumentation. Subjects that received traditional TKAs had slightly greater decreases in PROMIS depression scores pre to post-op (M = 3.13, SD = 7.14) compared to robotic instrumentation subjects (M = -0.81, SD = 5.33), t(55) = 2.37, p = .011. We found no difference in any form of surgical complications between groups. Surgery length, as measured by tourniquet times, was similar between groups. No differences in patient demographics were noted.

Discussion/Conclusion:

Transition to a kinematic, precision robotic technique has demonstrated encouraging short-term outcomes following total knee arthroplasty by remaining time neutral, and trending towards better functional outcomes. Clear advantages of robotic instrumentation by any specific functional measure have yet to be elucidated. However, even though individual functional variables failed to show significance, the aggregate effect of these differences may prove clinically important in larger samples with greater statistical power. Further randomized trials are necessary to characterize long term outcomes in this setting.

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Identification of Comorbid Anxiety and ADHD in Children with Autism Spectrum Disorder

Attention-deficit/hyperactivity disorder (ADHD) and anxiety disorders are the most common psychiatric comorbidities with autism spectrum disorder (ASD). The American Academy of Pediatrics has endorsed the use of the NICHQ Vanderbilt Assessment Scale to screen and monitor ADHD in both typically developing and children with ASD. The Vanderbilt also has subscales for other comorbidities such as oppositional defiant disorder, conduct disorder, and anxiety/depression. Despite its regular use as a screening tool, currently, there is limited research available on the utility of the Vanderbilt as an indicator of anxiety. The Screen for Child Anxiety Related Disorders is a validated screening tool used to identify specific anxiety disorders as well as general anxiety in children. The current study sought to determine if there is a correlation between scores on the Vanderbilt Anxiety/Depression subscale and the SCARED for children with ASD. By determining if there is a correlation between scores on the Vanderbilt and the SCARED, we can determine if the Vanderbilt alone can accurately identify anxiety symptoms in children with ASD and indicate to clinicians the need to further evaluate the presence of anxiety.

A retrospective chart review was completed of patients with a diagnosis of ASD seen in the URMC Division of Developmental and Behavioral Pediatrics in 2019 (N = 1931). For patients who had completed a SCARED and/or Vanderbilt, we collected scores on these assessments, as well as patient characteristics including age, race, cognitive level, and language level. A total of 48 patients were determined to have both a SCARED and either a Parent- or Teacher- completed Vanderbilt evaluation. Data suggests that the Parent-rated Vanderbilt Scale has a higher correlation with the SCARED than the Teacher-rated Vanderbilt scale with the SCARED. This preliminary data suggests that a Parent-completed Vanderbilt may aide clinicians in screening for comorbid anxiety disorder in children with ASD.

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Title: Acculturation and Diabetes Risk in the Breast Health and the Environment among Latinas in Los Angeles (BELLA) Study

Objective: To investigate the association between acculturation and diabetes risk in the Breast Health and the Environment among Latinas in Los Angeles (BELLA) Cohort.

Background: In the United States, diabetes prevalence among Latina American persons is nearly twice that of non-Hispanic White persons (13.9% vs 7.6%). To improve diabetes prevention and screening efforts, it is critical to understand the basis for the disproportionate diabetes burden in this population. Most Latinas living in Los Angeles are immigrant women predominantly from Mexico, El Salvador, and Guatemala. Acculturation refers to the often drastic and stressful process of social, psychological, and cultural change that immigrants face upon moving to a new country in order to assimilate, which may include learning a new language (English) and entering a new education system.

Methods: We recruited 400 women in the Los Angeles, California area from 2019 to 2022. We used language use, birth country, and duration of US residence (among those born in their native country) to assess acculturation. Participants self-reported a physician's diagnosis of diabetes during survey administration.

Results: Table 1 describes study demographics. Table 2 is an odds ratio table demonstrating the influence of acculturation on diabetes. We found a decreased odds of diabetes diagnosis in those who had education levels of some high school or above (0.64 unadjusted, 0.67 adjusted for age/BMI, 0.65 adjusted for age/BMI/insurance) in comparison to those who had less than a high school education. Furthermore, low language acculturation, or low English language proficiency, increased participants' odds of having diabetes by 3.02 (unadjusted), 4.71 (adjusted for age/BMI), and 5.27 (adjusted for age/BMI/insurance). Finally, there were inconsistent results in regard to participants' years lived in the United States and their odds of diabetes diagnosis.

Figure 1 is a spatial map describing the study population's living areas and proximity to various oil drilling sites and toxic release facilities that form the basis of the BELLA study.

Conclusions: In this study, less acculturation, in terms of education and language abilities, or corresponded to increased odds of diabetes. Thus, Latinas in Los Angeles who are least acculturated to the United States may be a target group for diabetes intervention programs. Further analyses must be done on this population longitudinally to be able to generalize and expand these conclusions.

Table 1: Demographics of the BELLA Study and Diabetes Prevalence

			Diabetes (%)[1]	
variable	levels	N	No	Yes
Mean Age	Calculated Age	53	145 (0.66)	74 (0.34)
BMI	Healthy Weight	33	26 (0.17)	7 (0.09)
	Obesity	118	70 (0.47)	48 (0.64)
	Overweight	73	53 (0.36)	20 (0.27)
Nativity (Country of Birth)	El Salvador	61	41 (0.27)	20 (0.25)
	Guatemala	18	10 (0.07)	8 (0.1)
	Mexico	139	90 (0.59)	49 (0.62)
	Other	14	12 (0.08)	2 (0.03)
Diabetes	No	157	157 (1)	79 (1)
	Yes	79	157 (1)	79 (1)
Education	<8th Grade	145	91 (0.62)	54 (0.72)
	Some High School+	76	55 (0.38)	21 (0.28)
Language Acculturation	Good	29	24 (0.15)	5 (0.06)
	Somewhat	78	53 (0.34)	25 (0.32)
	Low	127	78 (0.5)	49 (0.62)
Insurance	None	86	64 (0.41)	22 (0.28)
	Private	41	26 (0.17)	15 (0.19)
	Public	109	67 (0.43)	42 (0.53)
Menopausal Status	Postmenopausal	138	82 (0.53)	56 (0.71)
	Premenopausal[2]	96	73 (0.47)	23 (0.29)
Number of pregnancies	0-1	20	12 (0.1)	8 (0.14)
	2-3	42	28 (0.24)	14 (0.24)
	4	68	48 (0.41)	20 (0.34)
	5-10	46	29 (0.25)	17 (0.29)
Years in the United States	<21	51	36 (0.25)	15 (0.21)
	21-30	70	46 (0.32)	24 (0.34)
	31-40	62	45 (0.32)	17 (0.24)
	41-55	30	15 (0.11)	15 (0.21)
Occupation	Care Taker	24	14 (0.17)	10 (0.26)
	Cleaning	34	24 (0.29)	10 (0.26)
	Other	29	21 (0.25)	8 (0.21)
	Restaurant	24	18 (0.22)	6 (0.16)
	Retail	10	6 (0.07)	4 (0.11)

[1] Column % within variable categories

[2] also includes perimenopausal

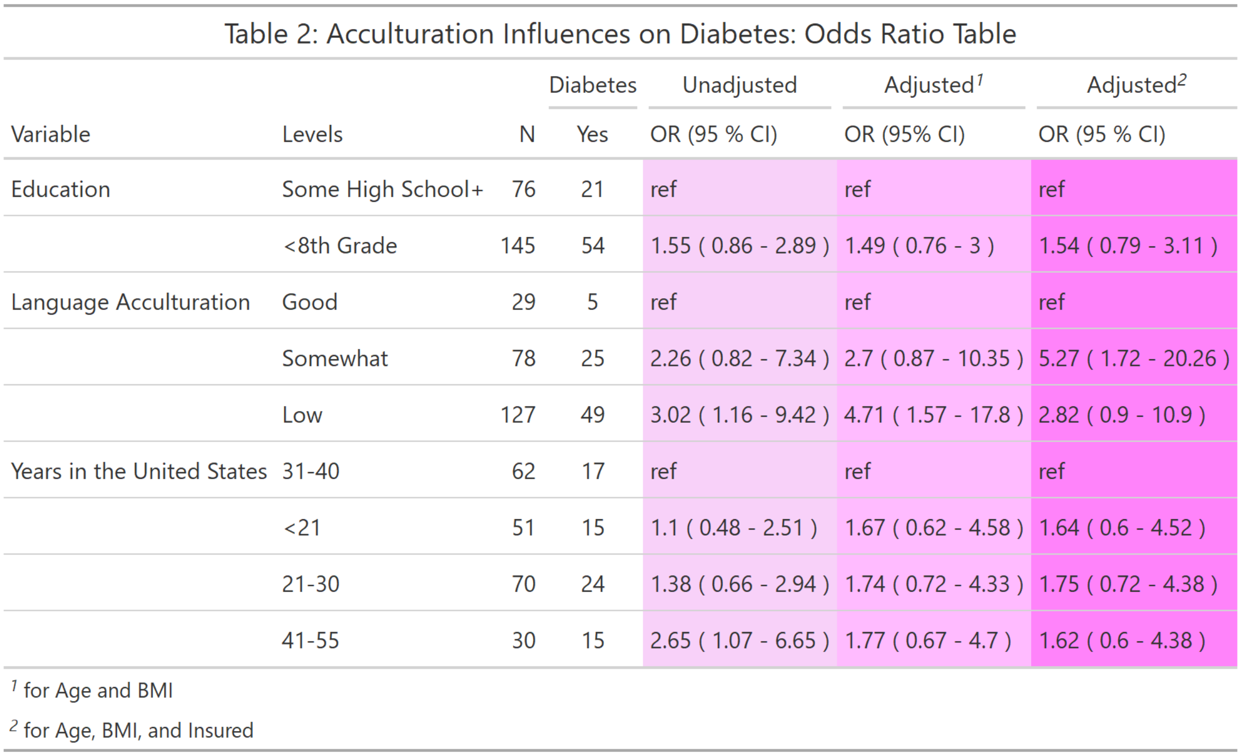

Table 2: Acculturation Influences on Diabetes: Odds Ratio Table

			Diabetes	Unadjusted	Adjusted[1]	Adjusted[2]
Variable	Levels	N	Yes	OR (95 % CI)	OR (95% CI)	OR (95 % CI)
Education	Some High School+	76	21	ref	ref	ref
	<8th Grade	145	54	1.55 (0.86 - 2.89)	1.49 (0.76 - 3)	1.54 (0.79 - 3.11)
Language Acculturation	Good	29	5	ref	ref	ref
	Somewhat	78	25	2.26 (0.82 - 7.34)	2.7 (0.87 - 10.35)	5.27 (1.72 - 20.26)
	Low	127	49	3.02 (1.16 - 9.42)	4.71 (1.57 - 17.8)	2.82 (0.9 - 10.9)
Years in the United States	31-40	62	17	ref	ref	ref
	<21	51	15	1.1 (0.48 - 2.51)	1.67 (0.62 - 4.58)	1.64 (0.6 - 4.52)
	21-30	70	24	1.38 (0.66 - 2.94)	1.74 (0.72 - 4.33)	1.75 (0.72 - 4.38)
	41-55	30	15	2.65 (1.07 - 6.65)	1.77 (0.67 - 4.7)	1.62 (0.6 - 4.38)

[1] for Age and BMI

[2] for Age, BMI, and Insured

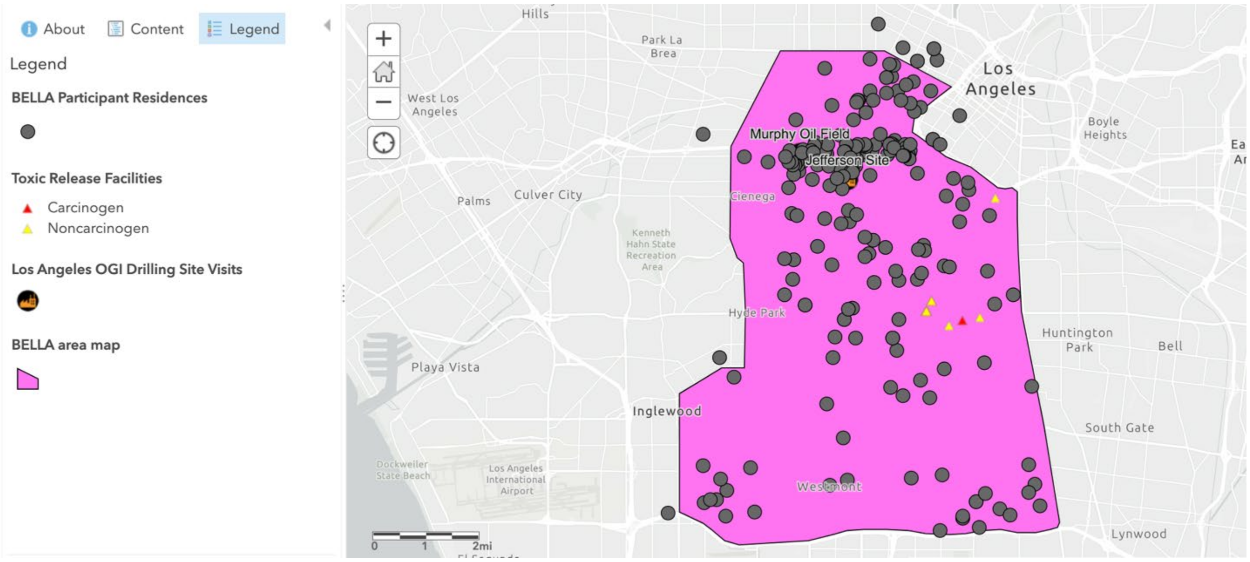

Figure 1: Map of BELLA Study Participants and Proximity to Oil Drilling/Toxic Release Sites

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Title: An Assessment of Mental Health Needs in Pediatric Patients with Inflammatory Bowel Disease (IBD) during the COVID-19 Pandemic.

Background: Inflammatory bowel disease (IBD) is a disorder characterized by chronic inflammation and a dysregulated response to microbiota in the gastrointestinal tract. The severity of the disease can vary and often consists of alternating periods of remission and relapse. While IBD can present at any age, approximately 25% of patients are diagnosed before 20 years of age (1). Additionally, many studies have indicated that adolescent and pediatric patients with IBD have a poorer quality of life and increased prevalence of psychiatric disorders requiring medications (1, 2). For example, a significantly greater usage of antidepressants was noted among adolescents with IBD in a nation-wide Finnish study (3). The aim of this project was to assess the burden and the kind of mental health issues facing our pediatric IBD population during the COVID-19 Pandemic.

Methods: A retrospective chart review was conducted on pediatric IBD patients (*N* = 140) seen at the University of Rochester Medical Center (URMC) from 2020 to 2021. Patient information, including sex, IBD type, symptoms at diagnosis, and age at diagnosis, was gathered from the medical record. Patients were excluded if clinical notes could not confirm their IBD diagnosis or if they only visited URMC once. Patient medication lists were reviewed for psychotropic medications. Medications used to treat ADHD, ADD, and chronic migraines were excluded. Mental health visits within the psychiatry, behavioral health, pediatric psychology, adolescent medicine, and social work departments were briefly reviewed and recorded.

Results: Of the pediatric IBD population sampled 56% were male, 44% were female, and the mean age of diagnosis was 11.2 years (SD: 3.74). Most individuals were diagnosed with Crohn's disease (77%), and a smaller percentage were classified as having ulcerative colitis (18%). Approximately 43% of the pediatric IBD population had at least one mental health concern over this time period, and the most common psychiatric diagnoses were depression alone (67%), anxiety alone (3%), or both depression and anxiety (30%). Patients who developed a psychiatric disorder reported more IBD-related symptoms at the time of their diagnosis compared to those without any history of psychiatric diagnoses ($t(136)=1.99$, $p=.02$).

Conclusions: Our results suggest there are high levels of depression +/- anxiety in children with IBD seen at URMC during the time of the COVID-19 Pandemic. Additionally, increased IBD symptoms at the time of diagnosis were associated with increased rates of psychopathology. Taken together, these findings suggest that more anxiety and depression screening is needed for pediatric IBD patients and that mental health services may be underutilized in the pediatric IBD population. Future directions include combining and comparing this data set with a previous pre-pandemic study performed at our institution to determine the full impact of COVID-19 on this population.

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Research done remotely through URSMD

Current advancements in the surgical management of facial paralysis

Introduction: Facial palsy has been a considerable challenge for the reconstructive surgeon. There is currently no conceivable surgery that can restore all 17 muscles of facial expression, no universal grading system that can offer standardized diagnoses or reporting of outcomes, and no way to reliably predict the results of a facial reanimation surgery even if the same procedure is performed by the same surgeon. But as our understanding of facial paralysis continues to evolve, so does our clinical assessment and management.

Objective: This article serves to update clinicians on how the landscape of facial nerve management has shifted since 2008, and review recent advances in surgical management that can be used in present-day treatment of the acute and chronic facial paralysis patient. This review will also elucidate what gaps exist in the current literature, in order to direct future research priorities.

Methods: The Pubmed database was reviewed in accordance with PRISMA guidelines. Articles published between 2008-2022 that reported on advances in surgical management for both acute and chronic facial palsy cases were identified. Publications not written in English, case reports, publications from nonscientific journals, cadaveric studies, and animal studies were excluded. A full-text review was performed on articles that fulfilled the selection criteria.

Conclusion: Artificial intelligence and deep learning are being applied to the assessment of patients and the measurement of their outcomes. Less invasive procedures are now available thanks to both novel surgical techniques and modifications to the gold standard treatments in the field. Strategies aimed at decreasing synkinesis, a sequelae of facial palsy. can help those with facial spasticity and contractures. Collaboration across the world and across the different specialties involved in managing facial nerve disorders has improved, which is sure to benefit continuity of care in the clinical setting as well as research in the lab. The last 15 years has introduced us to more reliable methods of reanimation surgery focused on reducing morbidity and improving quality of life through both form and function.

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Title: Associations Between Diabetes Mellitus and Endovascular Repair of Infrarenal Abdominal Aortic Aneurysms

Abstract:

Objective: Current literature has conflicting findings regarding the effect of diabetes mellitus (DM) and its management on outcomes of AAA repair. In this study we examined the effect of DM and its management types on late outcomes following EVAR.

Methods: We identified all patients undergoing EVAR for infrarenal AAA between 2003-2022 in the VQI with linkage to Medicare claims. Patients were stratified by their preoperative DM status, and then further stratified by DM management (dietary, non-insulin hypoglycemic medication (NIM), insulin). Outcomes of interest included sac dynamics at one year (regression >5mm, stable sac ≤ 5mm, growth > 5mm) and 8-year mortality, reintervention, and aneurysm rupture. These outcomes were analyzed with chi-square, Kaplan-Meier methods, and multivariable cox regression analyses respectively.

Results: We identified 34,021 EVAR patients of whom 20% had DM. Of all DM patients, 39% were managed by dietary management, 59% by NIM, and 19% by insulin. Following EVAR, DM patients were more likely to have stable sacs while non-DM patients were more likely to have sac regression at 1 year. (Table)

Compared with non-DM, DM was associated with higher risk of 8-year mortality (DM vs. non-DM: 29% vs. 27%/HR: 1.17[1.11 – 1.23]), but a significantly lower risk of 8-year rupture (1.3% vs. 8.0%/HR: 0.68[0.51 – 0.92]). Furthermore, within 8-years of surgery there was no difference in the risk of reintervention across the DM and non-DM populations (12% vs 12%/HR: 0.98[0.88-1.09]). (Table)

Following further sub-stratification, compared with non-DM, management with both NIM and insulin was associated with increased risk of 8-year mortality (29% vs. 27%/ NIM HR: 1.12 [1.05-1.20]; insulin HR: 35% vs. 27%/1.40[1.26-1.55]). Finally, compared with non-DM, specifically NIM was associated with lower risk of rupture within 8-years (1.2% vs. 8.0%/HR: 0.64[0.44 – 0.94]).

Conclusion: Although preoperative DM is associated with an overall greater risk of long-term mortality, it is also associated with lower risk of rupture following EVAR, which specifically appears to be driven by DM patients managed with NIM. Future studies will have to assess whether diabetes or NIM such as metformin are protective for rupture following EVAR.

Table. Adjusted Outcomes following EVAR stratified by Diabetic Status and Diabetic management type

EVAR						
Outcome (8 years)		Non-Diabetic Ref (26, 931)	Diabetes (Total pop) (7,013)	Diabetes (Diet) (1,559)	Diabetes (Non-Insulin) (4,139)	Diabetes (Insulin) (1,315)
Mortality	Event rate	27%	29%	31%	29%	35%
	Hazard Ratio (95% Confidence Interval)	-	1.17 (1.11 – 1.23)	1.10 (0.99 – 1.21)	1.12 (1.05 – 1.20)	1.40 (1.26 – 1.55)
Reinterventions	Event rate	12%	12%	13%	11%	11%
	Hazard Ratio (95% Confidence Interval)	-	0.98 (0.88 – 1.09)	1.02 (0.84 – 1.24)	0.97 (0.85 – 1.10)	0.97 (0.77 – 1.20)
Ruptures	Event rate	8.0%	1.3%	7.1%	1.2%	2.5%
	Hazard Ratio (95% Confidence Interval)	-	0.68 (0.51 – 0.92)	0.83 (0.49 – 1.39)	0.64 (0.44 – 0.94)	0.63 (0.32 – 1.23)
One-year Aneurysm Sac Dynamics						
		Non-Diabetic Ref (13, 512)	Diabetes (Total pop) (3,453)	Diabetes (Diet) (773)	Diabetes (NIM) (2,092)	Diabetes (Insulin) (588)
Sac Regression	Event % (p-value)	51% (ref)	46% (P<0.001)*	47% (P<0.001)*	46% (P<0.001)*	46% (P<0.001)*
Stable Sac	Event % (p-value)	42% (ref)	47% (P<0.001)*	45% (P<0.001)*	48% (P<0.001)*	48% (P<0.001)*
Sac Growth	Event % (p-value)	6.5% (ref)	6.5% (P= 0.96)*	7.1% (P= 0.87)*	2.3% (P= 0.87)*	2.0% (P= 0.87)*

**p-value comparison is non-diabetic group*

Title: The Effectiveness and Acceptability of Early Advanced Care Planning Visits for Patients with High Grade Glioma

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Research Location: Wilmot Cancer Center at the University of Rochester Medical Center

Abstract:

Background: Advanced care planning (ACP) facilitates important conversations around end-of-life care and quality of life for patients, their support members, and healthcare providers [1]. However, the frequency of deliberate ACP conversations is often quite low in clinical practice [1-2]. Furthermore, ACP is often delayed until severe disease progression resulting in many patients requiring a proxy to complete their ACP documents [2]. This is highlighted in patients with High Grade Glioma (HGG) due to early cognitive dysfunction, rapid disease progression, and high symptom burden [3].

Aim: The objective of this study is to report our experience with a structured early advanced care planning (EACP) visit that was incorporated into standard neuro-oncologic care in patients with HGG.

Methods: We conducted an Institutional Review Board-approved retrospective analysis of all patients with HGGs who participated in an EACP initiative in our clinic between March 1, 2020, and January 1, 2022. Records were reviewed to describe EACP visits, adherence to palliative care quality measures, advanced directive documentation, and patient outcomes. We compared the 40 patients in our study to previously published data regarding the standard of care at our clinic using chi-square tests and t-tests. Qualitative data regarding patient and provider experience with EACP visits was analyzed using content analysis.

Results: Our study cohort consisted of forty patients who completed the EACP visit. The median age was 58 years and 69% were male. The most common diagnosis was glioblastoma (61%) followed by anaplastic astrocytoma (35%) and anaplastic oligodendroglioma (4%). Sixty-one percent of tumors were IDH wild-type and 39% had gross total tumor resections.

Patients who completed the EACP visit (n=40) were more likely to have documented advanced directives (84.62%; $t(25) = -2.13$, 95%CI: [.69, .99], $p<.050$), were more likely to complete an emotional assessment by the second visit (46%; $t(25) = 2.42$, 95%CI: [.25, .67], $p<.05$), and were more likely to have hospice involvement more than seven days before death (88.89%; $t(17)=2.48$, 95%CI: [.73, 1.05]). There were no significant differences in timing of chemotherapy

administration between patients who did and did not complete EACP visits (t(15) = -.85, 95%CI: [.69, 1.06], p=.20) Survey data indicated that 100% of patients found the EACP visits to be “helpful” and “just the right length.”

Conclusions: EACP visits impart a wide variety of benefits to providers and patients including more thorough and deliberate ACP, improved adherence to quality measures, and acceptability to patients and providers. This underscores the need to include EACP as a part of standard care for patients with HGG. Future studies should investigate EACP prospectively to determine its effect of patient and caregiver outcomes.

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CAN 4-AP BE USED TO TREAT CIPN?

BACKGROUND:

Peripheral neuropathy refers to a condition that arises from damage to peripheral nerves. Chemotherapy and other drugs used to treat cancer can cause peripheral neuropathy, otherwise known as chemotherapy-induced peripheral neuropathy. According to the Center for Disease Control and Prevention, up to 70% of cancer patients that are treated with chemotherapy develop symptoms of CIPN. CIPN has a vast number of devastating effects on cancer patients, namely: reduced quality of life, poorer cancer survival rates, higher rate of relapse, and increase in overall treatment cost. While CIPN has such profound effects, there are currently no known effective or established treatments for CIPN.

RATIONALE:

The rationale for this research project is predicated on the discovery of a drug known as 4-Aminopyridine (4-AP) that has shown some potential for treatment of CIPN. Some of these potential benefits include repairment to axonal damage, myelin damage, and inflammation. It has also been shown that treatment of acute skin wounds with this novel drug has shown increased healing and regeneration of the neural components of skin as well as reduction of the inflammatory response. Some studies have also shown 4-AP to provide symptomatic relief to a vast array of neurological disorders of which there has been nerve damage. As opposed to many other drugs, 4-AP also shows prolonged effects after the elimination of the drug from the body. In other words, 4-AP enhances recovery well after treatment has been completed. In studies pertaining to acute peripheral nerve damage, 4-AP has indicated an ability to accelerate functional recovery, decrease muscle atrophy, promote myelin repair, and increase axon number. Here at URMC, 4-AP has also been tied to the treatment of Multiple Sclerosis and myocardial infarction. The most promising aspect of this treatment is that 4-AP is generally well studied, inexpensive, widely available, and has great clinical potential.

HYPOTHESIS:

As an overall hypothesis, the notion is that treatment of 4-AP is effective in decreasing or preventing CIPN. The goal is to provide basis to this claim by attempting to prove three fundamental sub-hypotheses. (1) 4-AP can be used to treat and/or reverse the symptoms of CIPN. (2) 4-AP can prevent the development of CIPN. (3) 4-AP has minimal impact on the efficacy of treating cancer cells using PTX chemotherapy.

METHODOLOGY/PROCEUDRE:

The subjects of research are 16-week-old female C57BL/6 mice that are injected with humanized hormone-resistant breast cancer cells. PTX chemotherapy will be the source to induce CIPN, given at a consistent 35 mg/kg every three weeks for four cycles. Tumor progression will be evaluated at the end of each chemotherapy cycle. For every experimental group, the animals will receive either the control or the intervention of interest (4-AP). The control consists of 2mg/kg of saline injected daily. The intervention consists of 2 mg/kg of 4-AP injected daily. In order to quantify the results of intervention the following outcome assessments will be utilized: *mechanical testing with monofilament, thermal sensitivity testing, gait analysis, electrophysiology analysis, histology, and serology*.

CONCLUSIONS:

Results of the experiment are still in progress, however initial data and analysis indicates positive correlations between 4-AP treatment and CIPN improvement and risk reduction.

Itch-specific Patient-Reported Outcomes (PROs) reveal differences in itch symptom experience in routine dermatologic care

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Background: Itch is a common symptom of dermatologic diseases associated with significant impairment of health-related quality of life (QoL), cognition, and functional ability.

Methods: This retrospective study elucidates how itch impairs QoL and disparities in itch symptom experience in dermatology patients. Patient-Reported Outcomes (i.e., Itch Numerical Rating Scale [NRS], ItchyQoL, 4 PROMIS Itch Short Forms [ISF: Mood/Sleep, Scratching Behavior, Interference, and Activity/Clothing], PROMIS Pain Interference, and PROMIS Anxiety) were administered on tablets during routine dermatologic care.

Results: Of 5,540 dermatologic clinic visits, all itch assessments were completed at 387 visits. Bivariate correlative analyses showed mild itch associated with emotional impacts on QoL (ItchyQoL-Emotion: $r=0.94$, $p<0.01$; PROMIS ISF-Mood/Sleep: $r=0.92$, $p<0.01$). However, severe itch associated with functional and emotional impacts on QoL (ItchyQoL-Function: $r=0.91$, $p<0.01$; ItchyQoL-Emotion $r=0.91$, $p<0.01$; PROMIS ISF-Activity/Clothing: $r=0.89$, $p<0.01$; PROMIS ISF-Mood/Sleep: $r=0.90$, $p<0.01$).

African Americans (AAs) reported more “severe-range” answers for 15 (88%) PROMIS Itch items and 15 (68%) ItchyQoL items. For severe itch, AAs had higher ItchyQoL scores than Caucasian patients (3.67 [3.2, 4.1] vs. 3.3 [3.1, 3.5], $p=0.03$). Further, more AAs with severe itch had “clinically significant” PROMIS ISF-Scratching Behavior (79% vs 48%, $p=0.02$), Mood/Sleep (54% vs. 28%, $p=0.05$), and Activity/Clothing (54% vs. 28%, $p=0.05$) than Caucasians.

Conclusions: PROMIS ISFs and ItchyQoL effectively assessed the impact of itch on QoL in a general dermatology clinic. Mild itch demonstrated an emotional impact on QoL, while severe itch expanded to a functional impact. Overall, AAs are more likely to suffer from greater itch-related impairment in QoL than Caucasian patients.

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Evaluating the Efficacy of Tecovirimat in Patients with Monkeypox Virus

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Background: The Monkeypox virus (MPX) has been detected in multiple non-endemic countries since May 2022. Although there are no approved treatments for MPX, three antivirals (brincidofovir, cidofovir, tecovirimat) have been utilized based on data from animal studies. The objective of our study was to conduct a systematic review to summarize and evaluate antiviral therapy efficacy for MPX among human patients.

Methods: Utilizing PRISMA guidelines, we searched PubMed and SCOPUS databases to identify studies available as of August 30th, 2022 utilizing antiviral treatment in human subjects for MPX.

Results: Six articles (two retrospective reviews, four case series/reports) totalling thirty-six patients (34 males, 2 females) treated with oral antivirals (32 tecovirimat, 3 brincidofovir, 1 cidofovir) met inclusion criteria. Of the patients included, the mean symptom duration before treatment initiation was nine days with fourteen percent of patients receiving post-exposure modified vaccinia ankara (MVA) vaccination. Forty-four percent of patients had <10 cutaneous lesions and 36% had 10-100 lesions. Eighty-eight percent had complete resolution with tecovirimat (n=28) and 100% had complete resolution with brincidofovir (n=3) and cidofovir (n=1). Tecovirimat was well tolerated with the most common side effect being fatigue (25%). All patients treated with brincidofovir developed elevated liver enzymes requiring treatment cessation. Tecovirimat also decreased hospitalization time (10 days) compared to brincidofovir (29 days).

Conclusion: This limited sample of studies suggests that tecovirimat is well tolerated and may be an effective antiviral for MPX. Further studies are required to better understand the role of antivirals for MPX treatment among human patients.

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Examining CVD Risk and CVD Associated Risk Factors in Patients with Vitiligo

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Abstract:

Vitiligo is an autoimmune disorder characterized by depigmented cutaneous macules. Although vitiligo may generally be considered a cosmetic disease, literature has associated psychological percussion and broader systemic comorbidities, including a higher risk for atherosclerotic events, dyslipidemia, and cardiovascular risk. Utilizing PRISMA guidelines, we searched PubMed and SCOPUS databases to identify studies available as of June 30th, 2022, examining CVD and CVD-associated risk factors in patients with vitiligo. Of 2553 articles, 7 studies (four cross-sectional and three case-control) totaling 611 patients diagnosed with vitiligo (56.3% female) met the inclusion criteria. Six studies suggested a significant association between patients with vitiligo and an increased risk for CVD via increased atherosclerotic events, CIMT, plaque presence, dyslipidemia, hsCRP, oxidative stress, and decreased levels of vitamin D, calcium, zinc, and antioxidants. However, one study found that patients with vitiligo presented with fewer cardiovascular risk factors and increased levels of HDL. Lastly, we found conflicting results between the association of vitiligo severity and CVD risk. Study characteristics are presented in Table 1. Additional studies are required to comprehensively understand the association between vitiligo and the risk of CVD.

Study author(s) and year published	Study Design	Data Collection location, year ranges	Study Group type	Number of Subjects	Age (mean years ± SD, or range, or median range)	Sex (M/F) (n)	Risk type/data reported in patients with V OR (95%)
Tang et al	Cross-Sectional Survey	China Oct. 2009 – Jan. 2010	Vitiligo	83	51-60	44/39	Coronary HD OR (95%)
2021			Control	9031	51-60	4,244/4,787	1.88 (1.03-3.41)*
Azzazi et al	Case-Control Study	Egypt	Vitiligo	50	40.0 ± 14.6	23/27	CIMT OR (95%) 4.827 (1.821 – 12.791) p-value = 0.001 Plaque Presence OR (95%) 4.235 (1.412 – 12.705) p-value = 0.006 Lipid Profile (mean ± SD) mg/dL Type Case Control p-value TC 214.60 ± 73.91 160.74 ± 37.88 <0.001 LDL 134.96 ± 58.95 91.28 ± 37.56 <0.001 HDL 49.44 ± 20.59 39.04 ± 11.15 =0.02
2022		Dec. 2018 – Jan. 2020	Control	50	Age-matched (NR)	24/26	
N. Namazi et al	Case-Control Study	Iran	Vitiligo	70	37.61 ± 12.27	37/33	Lipid Profile (mean ± SD) mg/dL
2021		Oct. 2016 – Feb. 2018	Control	70	38.86 ± 11.4	37/33	Type Case Control p-value TC 180.20 ± 31.74 160.57 ± 25.87 <0.001 LDL 106.57 ± 25.33 94.84 ± 17.55 =0.002 HDL 44.77 ± 9.89 48.01 ± 8.20 =0.036 MIM-CCA Correlations VASI r=0.482, p<0.01 Disease Duration r=0.386, p<0.01
Singh et al	Case-Control Study	India	Vitiligo	35	NR	NR	hsCRP oxLDL HDL
2019		NR	Control	30	NR	NR	p <0.01 p <0.05 p <0.05
Martins et al	Cross-Sectional Study	Brazil	Vitiligo	73	43.00 ± 17.82	25/48	Systolic BP (mean ± SD) mmHg Case Control p-value
2019		Dates NR	Control	57	49.35 ± 17.71	17/40	124.57 ± 18.01 121.19 ± 18.50 =0.01
M.R. Namazi et al	Case-Control Study	Iran	Vitiligo	83	20-50	33/50	Essential Hypertension Disease Duration VASI
2020		Jun. – Sept.2019	Control	83	20-50	33/50	p <0.04 p <0.497 p <0.681
Rodriguez-Martin et al	Case- Control Study	Spain	Vitiligo	105	44.4 ± 17.4 (14 – 85)	50/55	HDL – higher in cases p-value = 0.001
2011		Jan. 2011 – Aug. 2011	Control	95	49.1 ± 17.0 (16 – 87)	32/63	TG – higher in control p-value = 0.005

HD – Heart Disease; CIMT – Carotid Intima Media Thickness; TC – Total Cholesterol; LDL – Low Density Lipoprotein; HDL – High Density Lipoprotein; BP – Blood Pressure; MIMT-CCA – Mean Intima-Media Thickness of the Common Carotid Artery; VASI – Vitiligo Area Scoring Index; CVD – Cardiovascular Disease; hsCRP – high sensitivity C-reactive protein; oxLDL – oxidized LDL

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Parents and Vaccines: Engaging in Discussion

Background

In 2019, the World Health Organization named vaccine hesitancy a leading public health threat. [1] Additionally, the COVID-19 pandemic has exacerbated an already polarized discussion among parents on whether to vaccinate their children.

Thus far, several studies have identified a spectrum of reasons for parents/guardians refusing required and seasonal vaccines for their children. [1] First, influence from family members and community members played a crucial role in parents/guardians' decisions to vaccinate their children, leading to clusters of unvaccinated children in families and schools. [2] Additionally, a previous denial of vaccine side effects from pediatricians could lead to an escalating effect where parents lose confidence in all vaccinations. [3] Finally, changing vaccine schedules and general distrust of the pharmaceutical industry vaccine development strategies create a sense of mistrust in all vaccines. [4]

Researchers have also explored the growing polarization around vaccines and why parents in both camps have become increasingly polarized and vocal around their views. [5] These studies addressed the rise of social media and how it has polarized people and fueled strong language on both sides without creating a healthy medium for communication. [3] There is not yet much research on how parents' views on the COVID-19 vaccine impact their willingness to provide their children with more established vaccines such as the flu vaccine, HPV vaccine, MMR, and Tdap. [6]

Aims

The purpose of this study is to examine vaccine hesitancy among parents/guardians in Rochester, New York. Using focus groups, we aim to explore the barriers and facilitators parents face when vaccinating their children. Our goal is to understand parents' reasoning when deciding their children's immunization status and explore whether their thought process differs for the COVID-19 vaccine. Through exploring the attitudes and experiences of parents/guardians surrounding immunization, we will identify characteristics that help or hinder discussions with clinicians when discussing vaccines. The qualitative analysis from this study can inform future patient-centered care and improve access to immunizations.

Methods

We are in the process of recruiting participants for and holding focus groups over zoom. Our focus groups are composed of 4-8 people, split between parents who have opted to vaccinate their children for covid-19 and parents who have opted to decline the vaccine. We recruited participants through the Mt. Hope Family Center listservs and had over 90 parents/guardians express interest in the study through the recruitment form. We are currently in the process of running focus groups with the recruited participants. We are also collecting demographic data about participants via Redcap surveys to look for any significant trends among parents who chose to vaccinate vs. not vaccinate.

Our study questions focus on three main categories. Specific barriers and facilitators to accessing and understanding the covid-19 vaccine, opinions on the covid-19 vaccine when compared to other traditional vaccines, and interactions with pediatricians around vaccine discussions. The questions center around understanding the factors that most influence parental decisions to improve confidence in the covid-19 vaccine especially in traditionally under-vaccinated groups.

Next Steps

The research team will read and transcribe all transcripts before coding and will then meet as a team to decide between several analytic approaches, including but not limited to framework analysis, CQR, and line-by-line. Study investigators will use the demographic and feedback forms to describe sample characteristics and inform future studies. Our final analysis will also utilize direct quotes as ethnographic data.

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Implementation of Practice Change Relating to Vaccination in OB/GYN Practices

Background: Pregnant individuals can minimize their baby's risk of being affected by pertussis and influenza (flu) and their risk of contracting influenza by getting the flu vaccine during flu season and the tetanus toxoid, reduced diphtheria toxoid, acellular pertussis (Tdap) vaccine at 27-36 weeks of pregnancy. Complications such as hospitalization, preterm labor, and early death are more prevalent in pregnant people who contract flu infection. Infants under six months of age are at increased risk for both the flu and pertussis. Despite this, only about a third of pregnant people receive both immunizations. A practical intervention needs to be created and implemented to boost flu and Tdap rates for pregnant people.

Objective: To observe the implementation of interventions designed to improve flu and Tdap vaccination rates and compare the observations made to Plan-Do-Study-Act (PDSA) forms completed by vaccine champions each month of the intervention (July 2021-June 2022).

Methods: Health team members at 9 OB/GYN practices in Western NY participating in the VAX-MOM study were observed during patient encounters for pregnant people in June-July 2022. Nurses and medical assistants (MAs) affiliated with each practice were observed during patient intake. Data was gathered for 1-4 days per site. Notes about each encounter were compiled using a checklist and detailed description of observations. PDSA surveys filled out by nurse vaccine champions each month during the intervention (July 2021 – June 2022) were compared to observations made on site.

Results: Implementation of interventions such as pre-visit planning, using the "sticky note" in the electronic health record, and hanging up posters with vaccine information in patient rooms were both reported in PDSAs and observed often (Table 1). Interventions such as using presumptive language when offering vaccines, offering patient education, documenting historical vaccinations, and pending vaccine orders were documented in PDSA cycles, but were observed infrequently. Some common barriers to implementation of interventions that were observed on site were frequent staff turnover, provider or MA vaccine hesitancy and staff tentativeness to offer a vaccine again after it has been declined due to negative patient reactions.

Conclusion: Practices reported numerous interventions aimed at increasing vaccination rates for pregnant individuals. Observations were done outside of flu vaccination season, making it challenging to report on methods used to improve flu vaccination rates. However, pre-visit planning, sticky notes and posters for patient education were used consistently across practices and have the potential to increase rates of all vaccines due for pregnant individuals. Other interventions, such as using presumptive language and pending vaccine orders may need more ongoing reminders and training for nurses and MAs to implement consistently.

Table 1: PDSA forms completed by nurse vaccine champions compared to observations made on site

Key: **P**: PDSA only **PO**: In PDSA and observed **O**: Observed only	**Intervention**																						**Number of OB encounters observed**
	Communication							**Workflow**													**Other**		
	Presumptive language	**Patient education if defer/decline**	**Ask again if declined before**	**Ask Every patient (gyn or OB) about flu vaccine ***	**Patient education: emphasize benefit to the baby**	**Patient education: multiple vaccines at once**	**Patient education: flu early or late in the season***	**Pre-visit planning in note**	**Pink sticky note with vaccine info**	**Handouts available**	**Vaccine flipchart in exam room**	**Document historical vaccines**	**Vaccine information sent to new OB patients via MyChart**	**Vaccine information included in mid-pregnancy folder**	**Vaccine information in After Visit Summary or MyCare**	**Laminated cards outside patient rooms as reminder**	**Laminated signs "order flu vaccine"***	**Smartphrase to aid roomers**	**Checklist added to note with all prenatal interventions due**	**Pend vaccine order during rooming**	**Posters with Tdap and flu information**	**Flu clinics***	
Site A	P	P						PO	O	O		P					P				PO		**2**
Site B	P			P	P	P	P	O	O			P									O		**1**
Site C								PO	PO	O			PO	O		PO					PO		**8**
Site D	P	P						PO	O		O	P					P				PO		**6**
Site E								PO	O		PO				P						O		**10**
Site F	P		O	P	P		P	PO	PO						O					P	PO		**2**
Site G	P		PO	P	P		P	PO	PO	P					O			O		P	PO		**1**
Site H								PO													O		**5**
Site I			O	P				PO		P									PO		P	P (dc'd)	**12**

* Observations were made outside of flu season from June 2022 to July 2022

Barriers to Fertility Care after Diagnosis with a Gynecologic Malignancy

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Background:

Individuals who have received treatment for gynecologic malignancy often have reduced fertility options. However, there is a paucity of data on patient experience about this aspect of their treatment. The primary objective of this study was to quantify individual patient wishes about fertility preservation and perceived barriers they may have faced in pursuing fertility preservation, if desired.

Methods:

An online survey of 21 questions was distributed to 228 patients ages 18-40 at the time of diagnosis with ovarian cancer, endometrial cancer, or cervical cancer at a single, large academic hospital. The survey questions prompted individuals to reflect on the time when they found out they had cancer to evaluate how their diagnosis changed their fertility goals, whether respondents felt they had received adequate counseling on potential harm to their fertility due to treatment, and whether they felt they were supported if they had plans to become pregnant in the future.

Results:

53 patients completed the survey. Though 37 of the 53 patients (69.8%) knew cancer treatment impacted their fertility, 27 out of 53 (50.9%) respondents, did not feel they received adequate counseling at the time of diagnosis (Figure 1). The most frequent types of counseling patients received was verbal information from their oncologist (60.4% of patients) and researching independently (56.5% of patients). 18.9% of patients did not recall receiving any counseling (Figure 2). Looking at the types of fertility preservation patients underwent, 11 out of 53 (20.8%) had fertility sparing surgery and 6 (11.3%) tried various methods consisting of either oocyte preservation, ovarian tissue cryopreservation, ovarian transposition, or embryo cryopreservation. 35 patients (66.0%) did not undergo any fertility preservation. Patients who had children at the time of diagnosis were 75% less likely to undergo fertility preservation than patients who did not already have children at the time of diagnosis (Odds Ratio=0.25; 95% CI: 0.059, 0.88). Patients who did not choose to undergo fertility preservation were prompted to evaluate various reasons preventing them from accessing fertility care. The most common barriers included not wanting to delay treatment (50% of respondents), not wanting to have children (21% of respondents), feeling too emotionally burdened by their diagnosis (19% of respondents), and lack of adequate counseling from their provider (15%) (Figure 3).

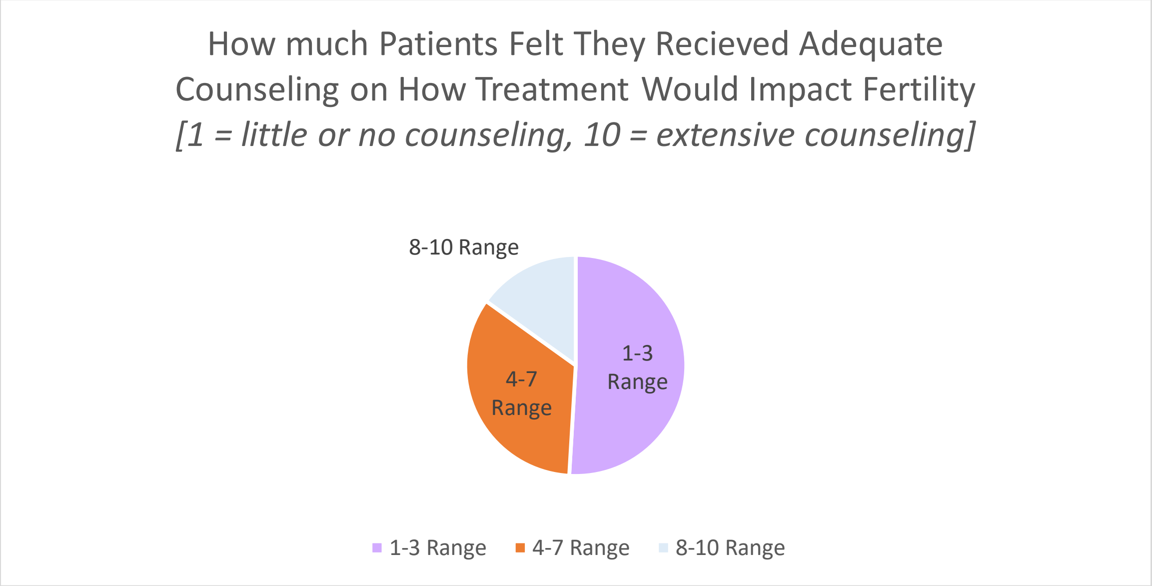

Figure 1

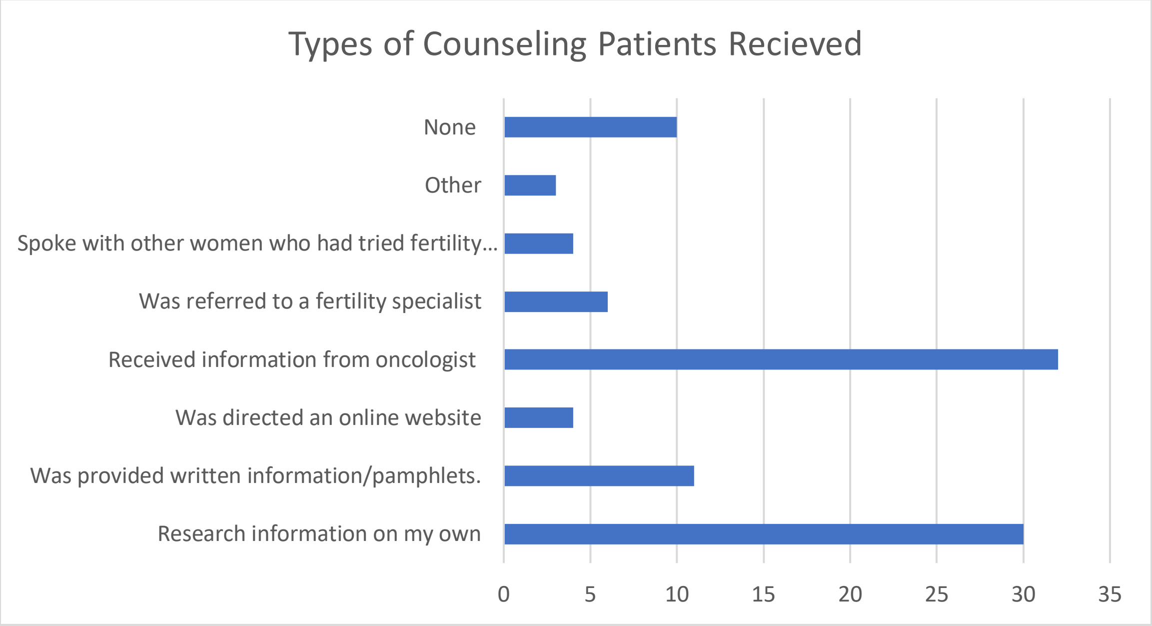

Figure 2

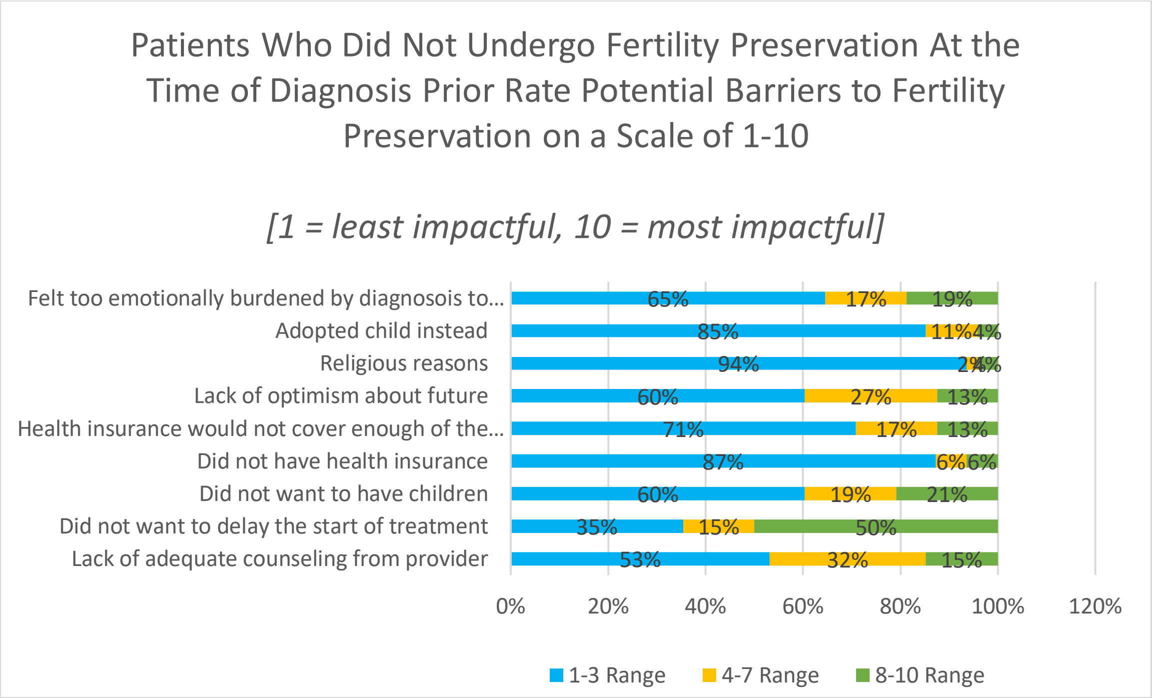

Figure 3

Conclusions:

Though most patients received some counseling about the impact of treatment on their fertility, the majority of patients did not feel this counseling was adequate. More work needs to be done to understand how best to support patients in their fertility preservation wishes, if applicable, while planning treatment for gynecologic malignancies. A follow up semi-structured zoom interview study is now being conducted to better understand the and best support patients in their fertility wishes, if applicable, while planning treatment for gynecologic malignancies.

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“Evaluation of the Impact of Teleophthalmology in Increasing Diabetic Retinopathy Exam Rates in different demographic groups”

Diabetic retinopathy is one of the main causes of blindness among working age adults yet most of the cases could be avoided with early detection and treatment. For diabetic people, excess sugar in the blood could damage blood vessels of the eyes and have adverse effects on the retina (light-sensitive cells of the eyes) even if diabetes is well under-control with diets and medications. As the complications continue, it could cause swelling in a small part of retina called macula, which is important for sharp vision. The symptoms include difficulty in reading, driving, recognizing faces, and so on.

Annual retinal screening of patients with diabetes is the standard clinical practice to detect and treat diabetic retinopathy. Access to health is a problem for individuals living in rural settings due to reasons such as lack of public transportation, health care providers shortages, and so on. In this project, we used telemedicine in assisting with delivery of healthcare services and which could reduce or minimize challenges or burdens that the patients might encounter such as lack of transportations. Utilizing this idea, we used diabetic retinopathy screening (DRS) in primary care settings to increase compliance with annual retinal exams. This was further enhanced with the help of Eye Picture archive and communication system or EyePACs (a license-free web-based system) designed to simplify the process of image capturing, storage, transmission, and evaluation.

The goals of this ongoing study were to (1) understand the impact of teleophthalmology on attendance and adherence of annual eye exam rates; (2) understand and explore the relationship between demographic factors to diabetic retinopathy screening and follow-up rates; and (3) understand patient flow. While the entire project will continue throughout the years, mine was a contained project within the continued research. For my part, I not only performed data entry and data analysis but also analyzed and reviewed different pathologies and visual acuity in different demographic groups in order to evaluate the impact of teleophthalmology on the retinal screening.

Since the study is ongoing, my conclusions are “preliminary” based on the specific data I looked at. I analyzed around 77 patients for the time frame of July-September 2022. Demographically, the follow-up screening rates among different groups were as follows: 7/10 (70%) Hispanics, 17/30 (56.7% Caucasians), 14/32 (43.8%) African Americans, and 2/5 (40%) Asians. Out of seventy-seven, eight patients had diabetic retinopathy: six had mild non-proliferative diabetic retinopathy (3 African Americans, 2 Caucasians, and 1 Hispanic), one had background diabetic retinopathy (1 African American), and one had severe diabetic retinopathy (1 Caucasian).

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Biofeedback-based Video Game Device to Treat Rage Attacks in Youth with Tourette Syndrome

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Background: Tourette Syndrome (TS) is a neuropsychiatric tic disorder characterized by the childhood onset of two or more motor tics and at least one phonic tic.[1] Approximately 20-40% of individuals with TS have rage attacks,[2,3] which are recurrent, explosive behavioral outbursts that can cause significant impairment in the quality of life of patients.[4,5] Of the respective symptoms that can be present, rage attacks are the most concerning for parents.[4,5] Despite the importance of reducing the effects of rage attacks in youth with TS as well as the complexity of treating these youth who may have other psychiatric comorbidities, there has been limited research on treatment. Most studies have focused on pharmacologic interventions, yet behavioral interventions have the potential to improve symptoms with fewer unwanted side effects. Mightier is a biofeedback-based video game device that may improve rage attacks in youth with TS by helping to teach emotional regulation through heart rate control.

Objective: To assess the feasibility and appropriateness of Mightier as a therapeutic intervention for rage attacks in youth with TS.

Methods: Subjects aged 6-12 years old with a diagnosis of TS and rage attacks were enrolled following consent between the months of October 2021 and May 2022 into a 20-week single-arm trial. Subjects were identified and recruited from the University of Rochester Child Neurology Tourette Syndrome Clinic and the University of Rochester Pediatric Behavioral Health and Wellness clinic. Feasibility was assessed by recruitment number and retention rate. Rage calendars were provided to the subjects' caregivers to document rage attacks. Efficacy was evaluated by assessing rage severity (Clinical Global Impressions of Rage (CGI-Rage), Rage

Outbursts and Anger Rating Scale (ROARS)) and overall aggression severity (Modified Overt Aggression Scale (MOAS)) pre-intervention and post-intervention. CGI-Improvement was completed post-intervention. Assessments of tic severity, OCD symptom severity, ADHD symptom severity, and quality of life were also completed.

Results: Of the current 8 enrolled subjects, 4 have completed the study and 1 has withdrawn due to medication changes during the study period. No screening failures occurred. Recruitment rate was 1.1 subjects per month and retention rate was 87.5%. Post-intervention results show that rage attack severity improved across 75% of subjects. Overall aggression improved by an average 0.5 points. CGI-I was rated as much improved or very much improved across all subjects. Family quality of life, measured by the PedsQL™ Family Impact Module, improved across 75% of subjects.

Conclusion: Mightier may be feasible for use in youth with rage attacks and TS based on our recruitment rate and retention. Preliminary efficacy outcomes are promising. The impact of Mightier may be of significance for a non-pharmacological treatment approach.

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Prevalence of lipoprotein(a) measurements in patients with or at risk of cardiovascular disease

Background:

Lipoprotein(a) [Lp(a)] is an apolipoprotein (B)-containing low density lipoprotein with an added apolipoprotein (a) bound to it. Lp(a) has been characterized as a highly prevalent, genetically determined and likely causal risk factor of atherosclerotic cardiovascular disease (ASCVD) and calcific aortic valve disease. The pathogenicity of Lp(a) can contribute to cardiovascular disease through pro-atherogenic, pro-inflammatory, and pro-thrombotic effects.

In a clinical setting, elevated Lp(a) levels can independently predict events related to myocardial infarction, stroke, peripheral arterial disease, and aortic valve stenosis. Knowledge of a patient's Lp(a) can refine their ASCVD risk and may motivate the clinician and patient to more aggressively modify ASCVD risk factors as appropriate. Despite recommendations for universal screening of Lp(a) in adults, the awareness of elevated Lp(a) as a risk factor as well as clinical uptake in screening for Lp(a) is suspected to be low.

Methods:

The study design consisted of an observational cohort study of URMC patients with or at risk of ASCVD between 2011 (when eRecord was instituted at URMC) to August 1st, 2022. The electronic health record (EHR) of all URMC patients >= 18 years old that met the inclusion criteria were queried to determine the number and percentage of patients who have had at least one Lp(a) measurement. Data collection for the study required use of University of Rochester Clinical and Translational Science Institute (UR CTSI), a program that supports research teams in acquiring data from institutional sources such as the EHR. Various statistical analyses were used to provide a descriptive and quantitative analysis of the data collected thus far.

Results:

Preliminary results of characteristics among participants with lipoprotein(a) measurements (n=2698) were collected and categorized. On average, the age at which Lp(a) was measured was 55 years old. 84.66% of participants identified as White or Caucasian, while 6.89% of participants identified as Black or African American. Historically, African Americans have been identified to have higher Lp(a) levels, likely contributing to cardiovascular disease, however many are not screened as demonstrated in this study. 9.19% of participants are current smokers, while 58.6% have never smoked. About half the participants have hypertension.

Figure 1 below displays the number of Lp(a) measurements taken over the course of 11 years at URMC. There has been a rise in Lp(a) measurements between 2011 and 2022, indicating a potential upsurge in knowledge of the benefits of measuring Lp(a) in a clinical setting.

Future aims include a comparison of those who have had their Lp(a) measured to those who did not based on cardiovascular disease outcomes and diagnoses. We would also like to investigate the provider ordering the test—whether they are a clinical lipidologist, general cardiologist, pediatrician, primary care provider, etc. Finally, we would like to quantify a change in lipid profile before and after the Lp(a) level is known to determine if the measurement altered management of current conditions.

Conclusion and Clinical Relevance:

Across the University of Rochester Medical Center, there has been a steady increase of Lp(a) measurements in the past several years. This is most likely due to the growing evidence for the role of Lp(a) in several cardiovascular diseases.

Increased Lp(a) and inherited lipid disorders, such as familial hypercholesterolemia (FH) can be found in co-existence and can exacerbate the risk of coronary artery disease. Measuring Lp(a) levels can help identify new cases and could also be used to initiate cascade screening of genetically related family members, allowing for targeted preventive measures and management. It is important to understand patterns of Lp(a) testing in clinical practice as directed therapies for elevated Lp(a) are currently ongoing and/or under evaluation.

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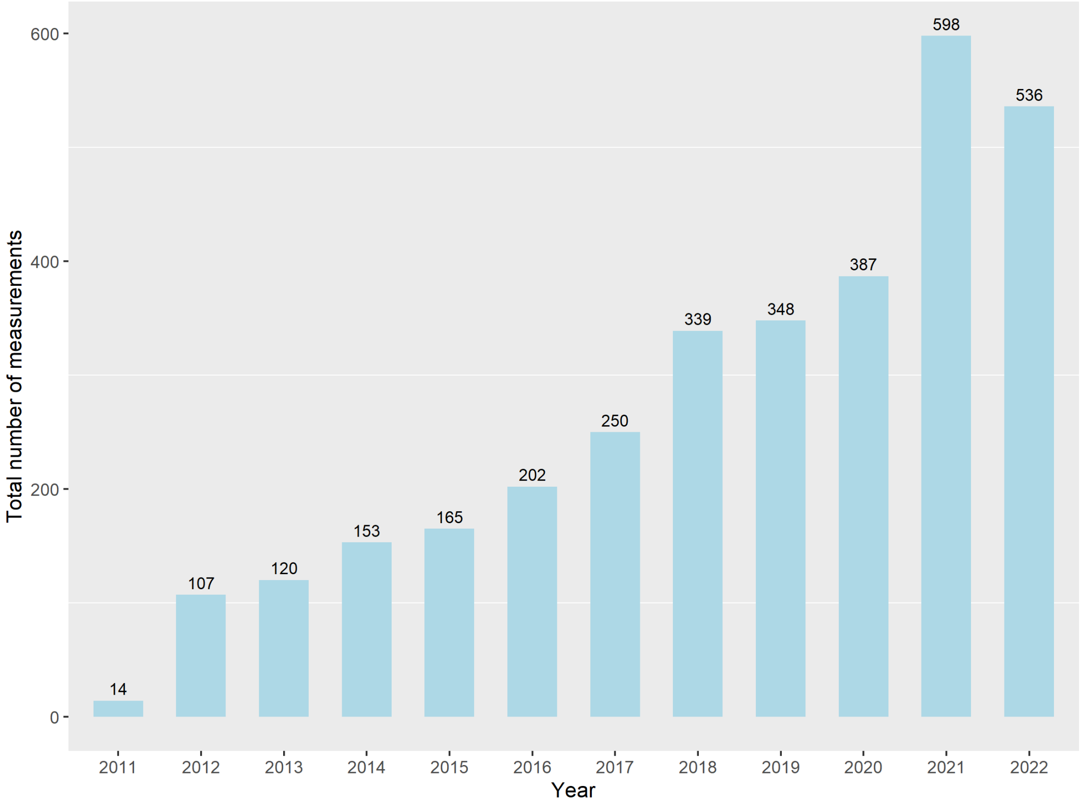
Figure 1: Number of measurements of Lp(a) over time (as of 08/01/2022):



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Do Visual Restoration Approaches Impact Clinical Perimetry in Occipital Stroke Patients?

Background: Unilateral, cortically-induced blindness resulting from damage to the primary visual cortex (V1) or its post-chiasmal afferents, is a debilitating, lifelong condition, for which there is currently no standardized rehabilitation strategy. Over the last few decades, experimental studies have shown that localized, repetitive perceptual training can improve a patient's visual sensitivity in their blind field (Saionz et al., 2021). The Humphrey Visual Field Analyzer (HFA) uses detection of a spot of light that has a known size, brightness, and location inside a hemispherical bowl to generate a visual field map of luminance sensitivity. While the HFA has been the gold standard for evaluating the size, location, and severity of stroke-induced vision loss in clinical practice, it is unclear how sensitive this measure might be to vision changes induced by perceptual training approaches. Here, we begin to answer this question by comparing psychometric improvement following visual training with changes in HFA metrics.

Methods: Data was gathered retrospectively from subacute (<6 months post-stroke) and chronic (>6 months post-stroke) patients who trained with either a contrast sensitivity task (static, flicker, or motion) or a coarse direction discrimination and integration task (CDDI). CDDI had a training cohort of 23 patients (chronic n = 11, subacute = 12), contrast training had a cohort of 19patients (chronic n = 12, subacute = 7). Patient's 24-2 and 10-2 HFA data were collected before and after training to generate a difference map using MATLAB, from which we computed and the area of the visual deficit (total area in which the pattern deviation <-5 dB). The perimetric mean deviation (PMD), which determines the overall difference in sensitivity between tested and expected hill of vision for age-corrected, normal population, was used as a second HFA outcome measure.

Results: All four training cohorts (Chronic CDDI, Subacute CDDI, Chronic Contrast, Subacute Contrast) patients exhibited training-induced psychophysical improvements, evidenced as a positive change in % correct performance for their trained task. However, there was a significant difference in % correct among the four groups (ANOVA: $F_{3,39}=10.06$, $p < 0.0001$) with CDDI-trained patients attaining a higher % correct change than contrast-trained patients (independent t test, unequal variance: $t_{29.9}=-4.9$, $p < 0.0001$). The HFA deficit size decreased an average of -38.4 ± 7.5 degrees^2 with no significant difference among the groups. PMD also improved by an average of 0.73 ± 0.18 dB, with no significant difference among the groups. While PMD change was correlated with deficit size change (r=-0.72, n=41, p<0.0001), neither PMD nor change in deficit size were significantly correlated with the magnitude of % correct change across training cohorts.

Conclusions: Patients who underwent different types of localized, visual discrimination training in their blind-field exhibited significant psychophysical improvement in % correct performance at

the trained locations. They also exhibited measurable improvements on HFA tests, with significant increases in PMD and decreases in deficit size. However, the magnitude of psychophysical improvement was not well-correlated with changes in relevant HFA metrics. This suggests a general lack of sensitivity of this clinical test to changes in visual perception induced by current rehabilitation techniques.

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Risk Factors for Recurrent Ventricular Tachyarrhythmia in Patients Receiving Primary Prevention Implantable Cardioverter-Defibrillators

Background: Implantable cardioverter-defibrillators (ICDs) have demonstrated efficacy in reducing mortality attributable to sustained ventricular tachyarrhythmia (VTA). Among patients with heart failure with reduced ejection fraction (HFrEF), guidelines recommend implantation of an ICD for primary prevention of sudden death. However, HFrEF patients with primary prevention ICDs remain at risk for first and recurrent VTA after device implantation. Importantly, recurrent VTA events in ICD recipients have been associated with increased morbidity and mortality. However, currently there are limited data on factors associated with recurrent VTA after the occurrence of a first episode in this population. Improved risk stratification may help tailor advanced therapies, such as catheter ablation or antiarrhythmic medications, to patients at a high risk for recurrence.

Objective: Identify risk factors that are predictive of recurrent VTA episodes in HFrEF patients with a primary prevention ICD.

Methods: Cohort study using data from the University of Rochester database of landmark ICD trials (MADIT-II, MADIT Risk, MADIT-CRT, MADIT-RIT and RAID). Patients were included in the study if they met the following criteria: 1) Received a primary prevention ICD and 2) experienced at least one episode of monitored or treated sustained VTA after ICD implantation. The primary endpoint was recurrent sustained VTA during long-term follow-up. All-cause

mortality associated with a recurrent sustained VTA episode was evaluated as a secondary endpoint.

Results: The study population comprised 789 patients who experienced a first VTA after ICD implantation. Mean patient age was 63 ± 11 years, and the majority of patients had ischemic cardiomyopathy (64%). The mean left ventricular ejection fraction was 24 ± 7%. Kaplan Meier analysis showed that the risk of subsequent VTA was very high (60% at 3 years after first event) regardless of baseline risk factors (Figure 1). Consistently, multivariate analysis showed that none of the baseline clinical risk factors (including age, sex, NYHA Class, ejection fraction) was significantly associated with increased risk of subsequent VTA. The occurrence of a recurrent VTA was shown to be independently associated with a significant 2-fold increased risk of subsequent death (HR=2.15, 95% CI 1.40-3.32, p=0.001).

Conclusions: Our findings indicate that, in HFrEF patients receiving primary prevention ICDs, the risk of recurrent VTA after a first event is high regardless of baseline risk factors. Recurrent VTA is a significant predictor of all-cause mortality in this population. These data suggest that intensification of HFrEF therapies, and possibly early catheter ablation, should be considered following the occurrence of a first VTA event.

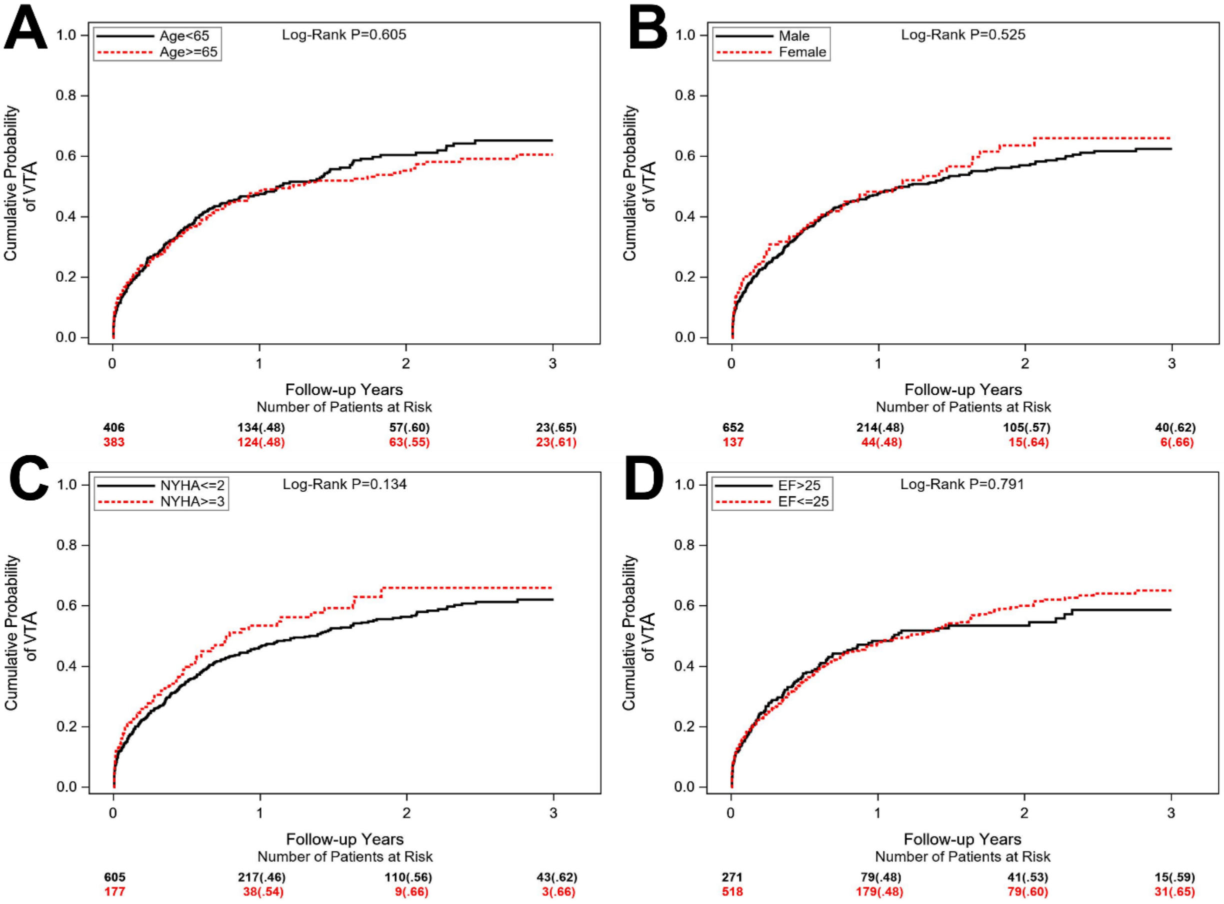

Figure 1. Three year Kaplan-Meier cumulative probability for VTA by (A) Age, (B) Sex, (C) NYHA Class, and (D) Ejection Fraction.

Zatar, Wasim

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Role of Myeloid Cells in Cerebrovascular Permeability and Reactivity in Older HIV Infected Individuals

Since the discovery of HIV, there has been remarkable progress in the treatment of HIV infection, which has dramatically changed the outlook of this disease, extending the life span of individuals. As a result, aging HIV infected individuals are now vulnerable to the same co-morbidities as the aging general population, such as cerebrovascular diseases (CBVD). Large epidemiological studies have suggested that CBVD is more common in HIV infected individuals compared to HIV uninfected individuals. However, little attention has been made to link CSVD with HIV pathogenesis; CSVD is strongly associated with cognitive impairment and is more directly linked to HIV mediated immune dysregulation than CBVD.

In HIV infection, CSVD could be the result of multiple mechanisms. In addition to the atherosclerotic mechanisms affecting the general population, older HIV infected individuals are exposed to HIV proteins, host immune activation products,and combination antiretroviral therapy (cART), which could affect the neurovascular unit (endothelial cells, microglia, pericytes, and astrocytes) that maintain cerebrovascular integrity. It is thought that aberrant platelet activation during HIV infection causes an increase in platelet-monocyte complexes (PMCs) that drives monocyte maturation from anti-inflammatory CD14+/CD16- to the pro-inflammatory CD14(+)/CDs16+ phenotype, which are associated with pro-inflammatory events. PMCs are therefore used as a marker, and it is hypothesized that PMCs can affect vascular permeability and reactivity, exacerbating the pathogenesis of CSVD. In addition, these changes are suspected to cause deterioration of cognitive performance overtime.

During this study, we will investigate how changes in vascular permeability and reactivity contribute to CSVD by affecting the microstructural integrity of blood vessels. Employment of magnetic resonance imaging sequences will be the used to quantify and qualify white matter structure integrity, vascular reactivity, and cerebral blood flow. Recruitment of 110 HIV infected (70 subjects with ages greater than 50 and 40 subjects with ages less than 50) and 110 HIV uninfected subjects matched for age and gender will be enrolled. Subjects in both groups will be required to undergo laboratory testing for specific biomarkers, MRI imaging modalities as listed previously, as well as various neuropsychological tests to measure cognitive performance. These procedures will be repeated at three-time intervals; 0 months (baseline), 18 months, and 36 months.

Data analysis for this project is not yet completed, and there has been no preliminary data so far. The data collection is ongoing, as subjects are nearing 18-month and 36-month follow-ups. Overtime, we will analyze the data and compile statistical measures outlining the results of the study. The results will compare data within each group, as well as comparing data between groups. With this data, we will be able to determine whether or not there is a unique pathogenesis of HIV infected individuals affected with CSVD and the impact that it has on cognitive performance.

Betti, Vincent

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UR Well Summer Internship at St. Joseph's Neighborhood Center:
Assessing the Need for Expansion of Gynecology Services

Background:

The University of Rochester has sponsored summer internships through a student-run group, UR Well, for the last several years. The internship has both a community engagement component in which students work full time at St. Joseph's Neighborhood Center for five weeks, and a research component in which students work on a scholarly project for three weeks. This year, the aim of the scholarly project was to assess the need for adding a "gynecology night" into rotation at UR Well specialty nights that take place at St. Joseph's Neighborhood Center on Tuesday evenings. This topic was chosen because reproductive health is an incredibly important aspect of personal and community health, and it is often difficult for patients to receive care. This is especially true for uninsured individuals, who are the basis of the St. Joseph's population.[1,3] For example, in 2015, 14 million women in the US had not been screened for cervical cancer in the preceding 3 years.[1] From this information, there is a clear gap in health care for uninsured individuals. Additionally, students often do not get exposure to GYN services in their first year of medical school. A potential UR Well GYN night would offer a way to increase the care provided to patients of St. Joseph's while also providing an educational opportunity to students.

Methods:

An 18-question survey was developed to assess the current access and satisfaction of St. Joseph's Neighborhood Center patients in regard to GYN care. The survey was distributed to all patients that are registered as "female" in the electronic medical record at St. Joseph's Neighborhood Center for a 10-week period.

Results:

Over the course of 10 weeks, 40 patients returned completed surveys to the front desk at St. Joseph's Neighborhood Center. The survey did not require participants to answer every question and, as a result, percentages reported will display the total number of individuals who answered the respective questions in parentheses. All patients reported their age, preferred language, and length of time as a St. Joseph's patient. Of the 40 respondents, 70% were aged 41-64, 15% were over the age of 65, 5% were aged 31-40, 5% were aged 26-30, and 5% were aged 18-25. 75% identified English as their primary language, 10% identified Spanish as such, and 15% chose another language as a preferred language – 2 Russian, 2 Turkish, 1 Haitian Creole, and 1 Ukrainian.

With respect to access to pap smears, 17.6% (n=34) reported not having received a pap smear in the last 3-5 years and 8.8% (n=34) reported never having received this service. Importantly, 14.7% (n=34) reported having a total hysterectomy.

Regarding chest (breast) exams and STI testing, 50% (n=40) patients reported having annual chest exams, and 17.5% (n=40) patients reported having annual STI testing.

When asked about the likelihood of attending a UR Well-sponsored GYN night on Tuesdays 55% (n=40) indicated an interest in attending. All patients who responded that they would be interested indicated that they would desire pap smears to be offered, 82% indicated that they would desire breast exams to be offered, and 36% indicated that they would desire STI testing to be offered.

Interpretation:

This survey supports the assertion that the majority of the services that would be offered by UR Well are satisfactorily provided St. Joseph's Neighborhood Center. This survey supports a need for increased education about pap smear frequency to ensure that individuals with cervices are properly screened. Additionally, the responses collected in this survey suggest a desire for routine breast exams within this patient population. While not harmful, it is recognized that these exams do not have the sensitivity or specificity to detect many cancers especially at early stages compared to mammograms.[2] Because the majority (85%) of patients in this survey were over the age of 40, and therefore at higher risk of breast cancer, it is reasonable to conclude that education about mammograms and financial assistance with respect to mammograms can be increased at St. Joseph's Neighborhood center.[2]

Given that the survey was offered for 10 weeks, and 22 individuals indicated that they would be interested in attending such a night, it is not recommended that the night be offered routinely because the principal service – a pap smear – is recommended to occur every 3-5 years, depending on the specific procedure. Additionally, the survey results suggest that the needs of patients are being met. With the current satisfaction of patient needs, it would not be a proper use of resources to allocate funds to such a night on a routine basis. UR Well specialty nights require attending physicians to donate their time, students to sign up to volunteer, staff of the center to donate their time for the duration of the clinic, and a supply of all necessary equipment for the procedures that would take place.

Conclusions:

Taken together, it is reasonable to recommend to St. Joseph's Neighborhood Center that education on pap smear frequency and mammogram eligibility be increased during the typical operations of the clinic. It seems reasonable to suggest that a pilot GYN night through UR Well could be offered, with the expectation that the night would run once a year, preferably during the summer months. It would be reasonable to ask the OBGYN student interest group to promote this night. This would allow interested students who are between their first and second years of medical education to gain experience with GYN services while providing quality care to patients in need. The infrequent nature of the night would help ensure that the number of patients – ideally two to five – would appropriately match the effort and expense of supporting the service.

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Use of the Emergency Department by Adult Refugee Patients in the Greater Rochester Area

Background

According to reports published by United Nation High Commissioner for Refugees (UNHCR), the number of displaced people worldwide has reached over 84 million in 2021, a 2.5 fold increase compared to this number in 2009. While the process of relocating to a foreign land is by itself difficult, stressful, and often dangerous beyond imagination, the long road of resettlement is no less daunting for refugees. Seeking appropriate and timely medical attention is one such challenges that refugees have to tackle with. Forming a sharp contrast with their unique healthcare needs is the barriers refugees face when seeking care. Frequently cited healthcare barriers for refugees include but are not limited to financial difficulties, language barriers, unfamiliarity with the American healthcare system, conflicting cultural beliefs, fear for deportation, mistrust of medical professionals, etc. All of these difficulties, combined with the health system's lack of awareness and institutional biases, make refugees one of the most disadvantaged groups in American healthcare.

Introduction & Objective

The Greater Rochester area has the tradition of being a major refugee resettlement center. Even during the height of COVID-19 pandemic and after the steep drop in refugee arrivals from 2016-2020, Monroe County has welcomed 133 new refugees arriving in 2021 alone. Currently, a majority of newly resettled UNHCR refugees receive primary care at Rochester Regional Health (RRH) Center for Refugee Health, a clinic with 15 staff members. However, being the only dedicated refugee clinic in the area, the Center has a tightly packed schedule especially with the ongoing pandemic. In the face of this sharp contrast between Rochester's role as a major refugee resettlement center and the relative scarcity of refugee healthcare resources, we suspect that refugee patients in the Greater Rochester Area might face extra difficulties when seeking primary care, which can act synergistically with many of the aforementioned difficulties, encouraging them to use the Emergency Department (ED) as an alternative source of primary care. In this sense, comparing the ED utilization rate of refugees and that of non-refugees could serve as a way to indirectly assess the accessibility and availability of primary care resources for refugees in the community. Additionally, lower healthcare literacy and disappointment/mistrust for primary care services are two of the most important reasons for patients using the ED for less acute visits. Both characteristics have been described with refugee patients, suggesting that patients with a refugee background might "overuse" the ED. Therefore, the objective of this study is to study how refugees use ED and how ED refugee patients differ from their non-refugee counterparts (medically and demographically). This study will help elucidate a range of public health issues like primary care shortage, refugee healthcare barriers, and inadequate healthcare education for refugees in our community.

Methodology

ED visits between January 1st, 2018 and June 30th, 2019 made by refugee patients are identified in eRecord. A list of Rochester-based primary care providers who only care for refugee patients or write clear notes for refugee patients were identified and were used as handles for identifying patient cases. A list of demographic and medical information including biological gender, primary language, chief complaint, length of stay, acuity index, etc. were collected. Pediatric patients were excluded from the study. Repeat visits by the same patient were removed from the dataset and the first ED visit by each patient in this 18-month period is used as the index visit. A control dataset with twice the sample size was collected, including only adult, English-speaking patients, evenly spread out throughout the study period. Average acuity index was calculated and the significance of the difference between refugees and controls was determined using student's t test ($\alpha=0.05$). Average length of stay was compared in a similar fashion. Refugee patients are further grouped based on their primary languages into geographical regions. Single-factor ANOVA test was performed to assess the variance of acuity between language-based patient groups. English-speaking and non-English speaking patients' acuity was also compared using student's t test.

This study has received Institutional Review Board (IRB) exemption (STUDY00007155). All patient data is deidentified using URMC RedCap prior to statistical analysis.

Results

358 refugee patient index visits and 716 control index visits were identified based on the criteria outlined above. Refugee patients reporting to the ED have significantly higher acuity index (2.910) compared to their non-refugee counterparts (2.727) ($p<0.0005$). On the other hand, the difference between the length of stay of the two groups is not statistically significant ($p=0.21$). Single factor ANOVA of refugee patients separated into rough geographical areas (South/Southeast Asian, Middle Eastern, African, and English-speaking) was not significant ($p=0.11$). Refugee patients of Latin American origin are not included in this analysis because of the small sample size ($n=11$). English and Non-English speaking refugee patients' acuity index comparison was also not significant ($p=0.29$).

Conclusion

Contrary to our initial hypothesis, refugee patients presenting to the ED from January 2018 to June 2019 have more acute conditions compared to their non-refugee counterparts. Although we have several speculations, a definitive explanation for this outcome is difficult to obtain with a chart review and warrants collection of information outside the electronic medical records. Language barrier, which was assumed to be one of the leading causes of refugee patients' difficulty when seeking care, does not explain the difference in acuity we discovered. Refugees' countries and regions of origin also do not affect their presenting symptoms' acuity in a significant way. Moving on, the next two goals of our study is to first identify factors that contribute to the higher acuity index of refugee ED patients through interviews with refugee members of the community; and second, to continue the chart review and analyze if refugee patients differ from non-refugees in terms of chief complaints, dispositions, comorbidities, and number of repeat visits.

TITLE: Spirituality and Spiritual Needs of Care-partners of Persons with Neurodegenerative Diseases: A Scoping Review of the Literature

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Place where research was completed: remote (NYC/Rochester)

Background:

Palliative care aims to alleviate suffering and provide comfort and compassion to those in our care.[1,2,6] Suffering and healing are central concerns when caring for patients, and in the face of such difficulties as a caregiver, spirituality can help give meaning to life and provide support.[3] In the palliative care setting, the existential or spiritual domain is an important determinant of quality of life.[4] Research has shown that spiritual needs, and spiritual distress, are common in patients who have been diagnosed with terminal and advanced medical conditions and patients desire their healthcare team participates in addressing their spiritual well-being.[4,5,6] Despite its importance in palliative care, the role of spirituality for family caregivers of patients with Neurodegenerative Diseases and likewise caregiver's spiritual needs has not received enough attention in the literature.

Family caregivers are the backbone of the US healthcare system; yet they remain invisible patients. These silent sufferers continually go under the radar, as this population is generally neglected by the healthcare system and research alike. Recent research conducted has found a correlation between mental and physical distress and the burden of caregiving.[7-12] While research has been examined how caregiving may feel like a burden, and the subsequent mental health effects it may have, there is limited understanding of how caregivers cope and make sense of their experience. Spirituality and spiritual needs of care-partners of those with NDD, which contribute to meaning making, is not adequately addressed in the current literature. The research questions for the study were the following (a) What are the dimensions of spirituality among CP of NDD? (b) What are the spiritual needs of CP of NDD?

In the Caring Physician, Peabody states "What is spoken of as a "clinical picture" is not just a photograph of a man sick in bed; it is an impressionistic painting of the patient surrounded by his home, his work, his relations, his friends, his joys, sorrows, hopes and fears." Understanding the spiritual needs and values among caregivers, is part of this portrait, and crucial in the provision of holistic care.

Aim: To conduct a scoping review of the literature on spirituality and spiritual needs of care-partners of persons with Neurodegenerative Diseases (NDD).

Methods: Scoping reviews, in comparison to systematic reviews, are better suited for examining the breadth of research published in an understudied topic of interest.[13] A scoping review of the literature was completed between May 20th and August 8th, 2022. The initial aim was to review the literature on spirituality and spiritual needs of care-partners of persons with Parkinson's disease. The preliminary search on PubMed yielded only 33 results. The search was then expanded to include NDD, and the published literature was then searched on 4 databases: CINAHL, PubMed, PsychInfo, and Embase. Reference lists of studies were also reviewed, and relevant literature were included. Inclusion criteria were publications in the English language, publications from peer-reviewed journals, and with adult human subjects. Case reports, letters, editorials, commentaries, non-research-based reports and abstracts, unpublished manuscripts, and conference abstracts and reports on proceedings were excluded. Results were imported into Covidence. Covidence is a web-based software platform, a tool to streamline primary screening and data extraction, primarily used for the production of systematic and scoping reviews. It is designed to make review production more efficient and organized during the data collection stage. Initial screening was completed by reviewing the title and abstract. A full review of manuscripts that met the initial screening process was completed. An excel spreadsheet was used as a literature matrix and relevant data on all the reviewed manuscripts was recorded in the matrix. A review of the literature matrix is ongoing following which a synthesis of the literature will be completed.

Results: Preliminary analysis of current data shows that caregivers of individuals with NDD conceptualize spirituality as a connection between a higher power, others, and the self. Though religiosity is distinct from spirituality, researchers tended to sometimes use the terms interchangeably. Care-partners of those with NDD experienced existential distress when witnessing the suffering of persons with NDD. For some the struggle and hopelessness strengthened belief in God and religious practices helped to cope with uncertainty. The spiritual needs of care-partners of those with NDD included a need to find meaning and to know what to expect in the future.

Conclusion: Preliminary analyses suggest that spirituality among care-partners of persons with NDD includes meaning making as well as a sense of alignment and connection.

Keywords:
- Spirituality, spiritual needs, spiritual care, spiritual pain, spiritual distress, spiritual well-being, existential suffering, religiosity, religion, hope, faith, connectedness, meaning in life, purpose in life, personal meaning, transcend, existential suffering, spiritual care
- Neurodegenerative Illnesses, Neurodegenerative diseases, ALS, Huntington's disease, Friedreich ataxia, PSP, MSA, Parkinson disease (PD) Parkinsonism
- caregiver, carer

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Thomson, Lexi

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Team Response in Case of Pregnant Mother with Terminal Cancer Diagnosis

Abstract

The maternal-fetal dyad brings up many unique bioethical conflicts requiring that clinical decision-making balance the interests of the mother and the fetus. There is a rich history of this balancing act devolving into situations defined by great conflict and moral distress. One prominent example is the 1987 case of Angela Carter who received a terminal cancer diagnosis during her 26th week of pregnancy. In her case, the court ruled in favor of a forced caesarean section against Angela's objections and without her consent under the reasoning that the fetus had a greater chance of living than she did. Angela died shortly after the surgery and the baby died two days later. We describe the clinical and ethical challenges raised by a semi-analogous case of a pregnant mother cared for by the Obstetrics Service of Strong Memorial Hospital whose top priority was the safe birth of a viable infant rather than her own physical well-being.

Discussion will include concerns around capacity and exploring the responses of different members of the healthcare team to the mother's request. Some felt at ease helping the mother to achieve her stated goal; others expressed discomfort while providing her care feeling that sustaining the mother's life for the sole purpose of fetal gestation reduced her personhood in an ethically unsound way. Despite these individual differences, what was notable was the widespread show of support and effective cooperation among the healthcare teams upholding the mother's autonomous decision. Ethical analysis will focus on the experiences of healthcare staff who participated in the care of the patient and on what principles or practices could serve as a model for how to successfully navigate other emotionally and ethically challenging encounters.

Student name: Kaden Zellers
Poster Title: A Variable Transition -- How and to What Extent Patient Autonomy Changed for Transgender People in the Mid-to-Late Twentieth Century United States
Mentors/Preceptors: Dr. Katherine Greenberg and Dr. Jessica Shand
Where I completed my research: Rochester, New York

A Variable Transition — How and to What Extent Patient Autonomy Changed for Transgender People in the Mid-to-Late Twentieth Century United States (Abstract)

As politicians in the United States increasingly threaten access to gender affirming care for transgender people, and particularly transgender minors, patient autonomy for transgender people faces new and terrifying limitations. Autonomy has a history of being greatly limited for transgender people. Looking at the limitations in the past can help us better understand, contextualize, and respond to the attacks occurring today. Patient autonomy more broadly did not gain strength in the United States until the mid-to-late twentieth century. Around the same time, the American public grew increasingly aware of transgender people. Such context prompts questions regarding how and to what extent patient autonomy changed for transgender people in the United States over these time periods, what influenced these changes, and how these changes impacted different transgender people. Through examining standards of care, as well as research papers from the 1950's through the 1990's involving transgender people, this paper seeks to answer such questions.

Patient autonomy for transgender patients grew during the 1950's, but in a segmented manner greatly influenced by the broader context of the time. Largely influenced by broader homophobia, sexism, dedication to gender roles, and a view of transness as a defective behavior, physicians of the 1950's withheld autonomy from transgender patients. Most opted for conversion therapy over any type of gender affirmation. As time went on, new definitions and views of transness as an identity as opposed to a behavior made the wants and goals of trans people more legitimate in the eyes of medicine. Various gender affirming procedures, particularly surgeries, became legal, more studied, and more accessible in the United States. Additionally, by the end of this time period physicians began to develop trust of transgender patients. However, such sentiments were not shared by all. Anti-trans rhetoric persisted, though with differing bases of rhetoric as explicit homophobia and sexism became taboo. Additionally, this medicalized legitimacy was originally only granted to a select few transgender patients. Those who did not fit established criteria, largely due to physical attributes, sexuality, or how they worked and survived continued to be restricted through the end of the 1990's. By better understanding these changes, we can better understand and respond to the situation we are in today, including the rhetoric that currently threatens transgender people, intracommunity conflict, and persistent problems within medicine.

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Title:

Adherence to Protease Inhibitor-Based Antiretroviral Therapy in Children and Adolescents with HIV in Zambia

Abstract

Objective:

To evaluate mediators of adherence among children and adolescents with HIV, comparing protease inhibitor vs. non-protease inhibitor treatment regimens.

Background:

Protease inhibitors (PIs) are currently one of the most commonly used antiretroviral classes for people living with HIV in low-and-middle-income countries. Current guidelines recommend the use of integrase inhibitors (IIs) over protease inhibitors in older children and adolescents with HIV, but it is unclear whether children currently taking PIs should switch. Prior studies in adults with HIV have demonstrated poorer adherence on protease inhibitor-based antiretroviral regimens compared to integrase inhibitors. However, the mediators of this are poorly understood. This study aims to analyze mediators of adherence and effects of switching from PI-based to II-based regimens in Zambia.

Methods:

A total of 95 participants were recruited for this prospective cohort study, all 8-17 years old. All participants with HIV had been treated with antiretroviral therapy for at least one year prior to enrollment. Adherence over 1 year of follow-up was assessed through standardized questionnaires and viral load measurement. Information regarding the patient’s regimen and adverse events impacting their adherence were also collected through standardized questionnaires. Semi-structured qualitative interviews were conducted to explore reasons for poor adherence and coded for themes.

Results:

Children taking protease inhibitor-based regimens were significantly more likely to report adherence problems over the prior 3 months (28% vs. 10%, p=0.03), and noted significantly more days with missed doses over the prior 7 days (median missed doses 1 vs. 0, p=0.02). Children taking PIs were also significantly more likely to have a detectable viral load (33% vs. 8%, p = 0.002). This effect persisted in multivariable regression models when controlling for age, sex, line of therapy, and WHO stage.

Qualitative interviews revealed that the most common reasons children gave for poor adherence included bad taste of medications, being away from home at the time medications were scheduled, and perceived side effects of medication.

Children taking PIs were more likely to report their medication as tasting bad (69% vs. 50%), and to report that bad taste was a problem affecting adherence (in 22% vs. 4%, p=0.05). Headache was more common in children taking PIs (in 17% vs. 4%, p=0.05). Other side effects were not significantly different between PI and non-PI groups.

Switching from a PI-based regimen to an integrase inhibitor was associated with an increase in median adherence (from 72% to 92%, p=0.01) and an increased probability of having an undetectable viral load (from 67% to 78%).

Conclusions:
Children taking PI-based regimens may be more likely to have adherence issues, and poor adherence may be partially mediated by taste as well as dosing schedule. Switching from a PI-based regimen to an II-based regimen may improve adherence and increase the probability of viral suppression.

Inflammatory and immunological biomarkers associated with cognitive impairment in pediatric and adolescent patients with HIV in Lusaka, Zambia: A sub-study of the HIV-Associated Neurocognitive Disorders in Zambia (HANDZ)

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Contributors: Caroline Kabwe, Sylvia Mwanza-Kabaghe, PhD, Milimo Mweemba MS, Pelekelo P. Kabundula, MS, Esau G. Mbewe, MS, Heather Adams, PhD, and Gretchen Birbeck MD, MPH
Location: University Teaching Hospital, Lusaka, Zambia

Background:

According to the Zambia Demographic and Health Survey, in 2018, HIV prevalence in Zambia for people aged 15 – 59 years was 11.1%, and 66,000 children under 15 were HIV positive.[1] HIV is associated with neurocognitive impairment, and current antiretroviral therapy (ART) is not protective against some of the neurological impacts of chronic HIV infection.[2] This could be because of CNS inflammation,[3] neurotoxicity accompanying ART,[4] or other HIV comorbidities.[5,6]

In addition to the etiology of HIV-associated neurocognitive impairment being unknown, the biomarkers that could clarify this risk are similarly unknown. Biomarkers like interleukin-6 (IL-6),[7] soluble CD163 (sCD163),[8] soluble CD14 (sCD14),[9] C-reactive protein (CRP),[10] tumor necrosis factor-α (TNF-α),[11] TNF-R1,[12] and TNF-R2,[12] have implications in monocyte activation and inflammatory response, making them strong candidates for investigation as to their involvement in HIV-associated neurocognitive impairment. Non-classical monocytes and activated platelet-monocyte complexes also play a role in chronic inflammation in the context of HIV,[13] making them strong candidates for investigation as well.

The HIV-Associated Neurocognitive Disorders in Zambia (HANDZ) study is a longitudinal prospective cohort study that aims to develop culturally appropriate tools for screening for neurocognitive impairment, assess specific biomarkers as candidates for indicating future neurological outcomes, and review the clinical significance of neuroimaging data. It will do this by examining differences between HIV-positive patients and HIV-exposed negative controls over five years. Annual assessments are made by providers, which include comprehensive assessments of mood, behavior, and neurocognitive abilities, checks on medication adherence, analysis of blood samples, and reviews of medical and social history. As a result, data collected from this study can provide answers regarding the relationship between HIV, neurocognitive function, and inflammatory and immunological biomarkers of interest.

Objectives:

1. To examine differences in monocyte populations and activated platelet-monocyte complexes between HIV-infected, HIV-exposed uninfected, and HIV-unexposed populations.
2. To determine whether various soluble biomarkers (including IL-6, sCD163, sCD14, CRP, TNFα, TNFR1, and TNFR2) are associated with cognitive function in any sample groups at baseline.
3. To determine whether various soluble biomarkers (including IL-6, sCD163, sCD14, CRP, TNFα, TNFR1, and TNFR2) are associated with neurocognitive changes over time.

Methods:

The longitudinal prospective study completes annual blood collection and biomarker analysis, controlling for confounding variables of illness and fever. Through study follow up, over two years of data on subjects' biomarkers have already been collected in annual comprehensive visits with providers at University of Zambia's University Teaching Hospital (UTH) as part of the study.

The quantity of each soluble biomarker was measured as a continuous variable by Ella Multiplex Cytokine Analyzer (EMCA).[2] For immunological markers, the proportion of classical, intermediate, and non-classical monocytes, as well as the proportion of platelet-monocyte complexes were determined with a standardized flow cytometry protocol and analyzed with FlowJo software. Baseline and follow-up cognitive function are assessed comprehensively via a series of assessments including a gold-standard neuropsychological assessment, the NIH Toolbox Cognition Battery, a Mood and Behavior Assessment, and the NIH Toolbox Emotion Battery (both parent proxy and self-report measures). They are quantitatively represented by NPZ8 scores.[2]

ANOVA analysis was conducted on the mean concentration of immune cell populations and biomarker presence in the blood samples, stratifying the data into sample groups of subjects who 1) are HIV-exposed and HIV positive, 2) are HIV-exposed and HIV negative, and 3) are HIV-unexposed and HIV negative. Immune cell and biomarker levels were compared to the cognitive function scores (NPZ8 scores) of the participants in each of the three groups at baseline. Linear regression was used to analyze changes in participants' NPZ8 scores to immune cell and biomarker levels over the data collection period, while controlling for confounding variables.

Results:

Biomarkers sCD163, sCD14, CRP, and TNFα were found to be in significantly higher concentrations ($p < 0.05$) in the HIV-infected cohort as compared to the HIV-exposed uninfected cohort. In contrast, TNF-R1, TNF-R2, and IL-6 were found to be in significantly higher concentrations ($p < 0.05$) in the HIV-exposed uninfected cohort. When stratified by cognitive performance within cohort, for both the HIV-infected and the HIV-exposed uninfected cohorts, sCD163, CRP, TNF-R1, TNF-R2, and IL-6 were all found in significantly greater concentration ($p < 0.05$) in neurocognitively impaired participants as compared to participants with unimpaired cognitive function as determined by the neurocognitive battery described above.

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Exploring the Health and Social Benefits of a Community Farm for South Asian Refugee Farmers in Rochester, NY

Background: Food insecurity in the U.S. remains a critical public health issue as it operates at the nexus of race, socioeconomic status, and geographical location. As a major social determinant of health, it is defined by the limited ability to access or acquire enough food to pursue an active and healthy life. Its causes are multifactorial, which include poverty, unemployment, neighborhood conditions, systemic racism, and racial discrimination.[2] Consequently, the prevalence of food insecurity is not distributed equally amongst the population; racial and ethnic minorities experience a disproportionate burden of food insecurity compared to their white counterparts. This is especially alarming given the relationship between food insecurity and adverse health outcomes. Food insecure adults are at an increased risk for obesity, diabetes, hypertension, and poor mental health.[4] Programs and interventions that seek to decrease food insecurity are critical to mitigating racial health disparities across the nation. [3] National food insecurity rates among recent immigrants from Asian and Pacific Islander countries are highest among Bhutanese (30%) and third highest among Nepalese (25%) immigrants.[1] This study addresses a gap in the literature by investigating the relationship between community farming programs and health outcomes for South Asian refugees.

Objective: The goal of this qualitative research project is to explore the health and social benefits of a community farm on local community members who manage small gardening plots. The farmers are predominantly South Asian refugees from Nepal and Bhutan. A better understanding of how this community farm impacts this marginalized group is imperative in addressing racial health disparities related to food access and food justice.

Methods: A community-based participatory research framework was used to evaluate the community farm's impact on food access, physical activity, and mental health on the South Asian refugee farmers. 11 in-person semi-structured interviews were conducted using an English-based written survey and a native Nepali interpreter. The survey tool included 6 demographic questions and 6 open-ended questions. Interviewees were selected based on convenience sampling methods given farmer availability. Audio interview recordings were transcribed and coded by two separate evaluators to assess for concordant themes. Thematic codes were generated using a grounded theory iterative research approach.

Results: 11 total farmer interviews were conducted between June and July 2022. 7 (63.6%) identified as men, 4 (36.3%) women; 9 (82%) Nepali Bhutanese, 2 (18%) Nepali, with an average age 46 years.

Thematic analysis of the data elucidated four major themes: increased food access, physical activity engagement, social connectedness, and therapeutic restoration. These findings are consistent with findings from relevant literature. Many farmers described the importance of the farm as a mechanism to access affordable, high quality, culturally relevant produce that was reminiscent of their home country.[5] Farmers also expressed increased levels of exercise while working on the farm.[6] Social connectedness was noted to be a critical benefit, as the farm served as a physical space where a shared language and cultural identities facilitated communal bonding and information sharing.[7] Lastly, the mental health benefits were salient, as farmers detailed how engaging in farm activities brought them mental peace and mitigated life stressors.[8]

Conclusions: The data demonstrates multidimensional benefits related to food access, physical, mental, and social health. Notably, this project elevates the voices of a marginalized refugee population which can inform future research directions to ameliorate food insecurity and racial health disparities.

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A Feasibility Study of Recruiting Research Participants with Familial Hypercholesterolemia using MyChart for Recruitment

Familial hypercholesterolemia (FH) is a genetic disorder of elevated cholesterol that predisposes to premature heart attack and stroke, which can be fatal.[1,2] It is only diagnosed in 10% of affected individuals, making early identification and prevention all the more crucial and beneficial.[1] When left untreated, FH is the most common life-threatening genetic disorder.[1] There is evidence that the Electronic Health Record (EHR) can be used to improve the diagnosis of FH.[3,4,5] This study would like to explore the feasibility and effectiveness of utilizing the EHR as a tool to recruit patients into FH studies. Unlike other studies, however, this project will incorporate both patient and physician perspectives in our qualitative evaluations. This pilot study will have a duration of approximately 1 year and will involve the recruitment of up to 30 study participants meeting the inclusion criteria and conducting up to four (4) focus groups (6-8 participants per group, maximum 12) and up to twenty (20) individual key informant interviews from amongst these same 30 participants. The study population will also include one to five cardiologists via convenience sampling. Research Subjects Review Board (RSRB) approval has been obtained and the research team is in training for use of the MyChart for Recruitment tool. 20 potential study participants have been selected based on the inclusion criteria of 1) having a diagnosis of FH and 2) being 18 years or older. Study participants will be provided consent documents to take part in focus group/key informant interviews. Guides with sufficiently open-ended questions have been prepared and will be administered according to a worked-out schedule with study participants. All interviews and focus groups will take place over HIPAA-compliant Zoom software. Data analysis will involve evaluating and synthesizing answers from study participants, identifying overarching themes and patterns. This study will elucidate the utility of using the MyChart for Recruitment tool to recruit research participants for studies related to familial hypercholesterolemia.

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Creating a Machine Learned Based Decision Support Tool for Trauma Triage

Introduction

Providers are typically expected to make trauma triage decisions within two to three minutes. In this short period of time, they must synthesize their understanding of the patient's current physiologic and anatomic state, field triage scores, and prior clinical knowledge to best triage the patient. Therefore, the need for speed and accuracy during triage is vital, but due to the complexity of such medical situations, under- and over- triage are commonplace. Accurate trauma triage is not only vital for preserving resources for those in need, but also for preventing patient mortality in severe situations.

Data-driven machine learning models can better support providers' decision-making processes and highlight insights from years of prior data. These models can compute results within milliseconds and provide reasoning behind the trauma activation level assigned. The current study explores the process of creating machine learning models for predicting trauma activation level and presents a preliminary model that may be developed further into a decision support tool for providers in the Emergency Room setting.

Methods

Following IRB approval, we retrospectively collected data from the institutional trauma registry for all patients who activated a trauma team response from January 2014 to December 2020. Predictors for the model included patient demographics, pre-hospital interventions, comorbidities, mechanism of injury, and engineered features based on the institutional trauma criteria. Trauma activation level was the outcome of interest, calculated using the Cribari matrix and defined as Level 0 (consult and partial activation) and Level 1 (full activation). The data set of 10,374 patients was randomly divided into training (80%), validation (10%), and testing (10%) sets. Four classical machine learning models, including logistic regression, support vector machine, random forest, and gradient boosting tree were trained. Area under the receiver-operating curve (AUC) ± 95% confidence intervals were used to quantify the performance of each model.

Results

Out of all the models, logistic regression performed the best followed by random forest, gradient boosting tree, and support vector machine with results presented in Table 1. The features that were weighted most heavily when predicting trauma activation level for the logistic regression model are visualized in Figure 1.

Model	**AUC ± 95% CI**
Logistic Regression	80.66 ± 2.22e-16
Random Forest	79.71 ± 0.09
Support Vector Machine	65.71 ± 3.07e-05
Gradient Boosting Tree	72.03 ± 0.00

Table 1. AUC metrics to evaluate performance

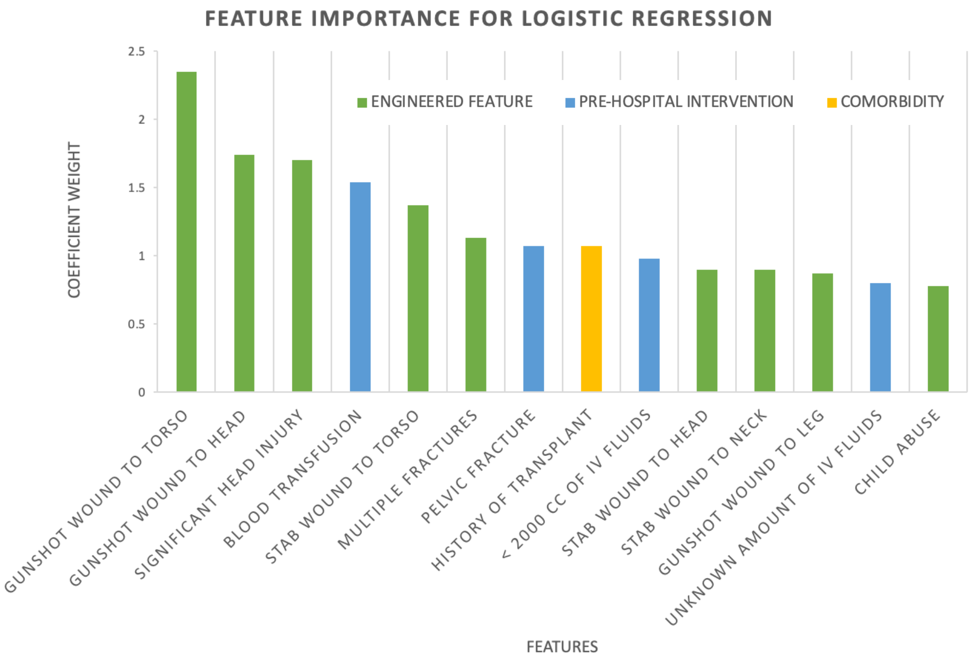

Figure 1. Engineered features were handcrafted based on existing mechanism, comorbidity, and pre-hospital intervention data to best mimic institutional trauma triage guidelines. Pre-hospital interventions were interventions performed on the patient prior to arrival at the hospital. Comorbidities were identified in the patient's chart based on their past medical history.

Conclusion

By harnessing the power of machine learning, we can retrospectively understand what factors correlate most closely with triage level, as well as learn from our mistakes when patients were incorrectly triaged. Unfortunately, especially in fields that are newer to machine learning, models are often trained with flawed input data that produces faulty results when taken at face-value. In our work, rather than naively training the models on provider assigned trauma activation levels, the Cribari matrix was utilized to create a ground truth. When trained on objective trauma activation labels, ML models have the capacity to support providers when they make split second decisions and can help reduce under- and over-triage.

Developing Biomarkers for Chronic Low Back Pain Using Arterial Spin Labeling

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Chronic pain is a prevalent health issue. More than 100 million people in the US suffer from chronic pain, which leads to tremendous physical, emotional, and financial burden on individuals and on society. However, robust diagnostic and prognostic tools in clinical care for chronic pain remain lacking. Arterial Spin Labeling (ASL) is a non-invasive perfusion-based MRI technique that can quantify, without contrast injection, cerebral blood flow (CBF). In this study, we aim to 1) utilize ASL to develop neurophysiological quantification of the subjective and variable pain experience, and 2) investigate the feasibility and reliability of incorporating ASL in routine clinical scans. We collected resting-state ASL data from 43 patients with chronic low back pain (CLBP) and 33 healthy controls (HC) on a research scanner, as well as 9 CLBP patients and 10 HC on a clinical scanner. Brain perfusion maps were generated to quantify the CBF and relative CBF (rCBF) to regions of interest. Compared to HC, CLBP patients had significantly higher CBF in the Nucleus Accumbens (NAcc). This result is consistent with our previous finding using fMRI BOLD signal. Both results support the altered motivational and hedonic aspect of chronic pain because the NAcc is a limbic-motor interface translating motivations to action. They also support the use of the NAcc activity as a biomarker for chronic pain. We also observed linear correlation between CBF from the clinical scanner and the research scanner (r^2=0.56). This ongoing project serves as a pilot study for incorporating ASL protocols in the development of chronic pain biomarkers and for usability of ASL in clinical care.

Outcomes Associated with Whole-Genome Sequencing in Acutely Ill Infants with Suspected Genetic Disease

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Of infants admitted to the Neonatal Intensive Care Unit (NICU), those with genetic disorders are especially vulnerable to increased morbidity and mortality. However, due to the variability of presentation as well the heterogeneity of genetic disorders, they are exceptionally difficult to diagnose etiologically [1]. Whole genome sequencing (GWS) is a promising clinical diagnostic tool that can potentially benefit critically ill infants and their families by providing a precise, timely diagnosis and therefore lead to more effective clinical management [1].

The objective of the current study is to determine the efficiency and real-world clinical implications of using WGS technology in critically ill infants admitted to the NICU with a suspected genetic disease. This retrospective cohort study includes 28 infants admitted to the University of Rochester Medical Center NICU between June 2020 and June 2022 with following diagnoses, but no clear underlying etiology: seizures, hypoxic ischemic encephalopathy, metabolic disorders, respiratory failure, multiple congenital anomalies, neuromuscular disease, and arthrogryposis (congenital contractures). Mean age of testing was 35 days, and the majority of infants required respiratory support. Multivariate logistic regression analysis will be performed to assess the association of WGS and the primary endpoint of diagnostic efficacy.

While data analyses are still ongoing, preliminary results show a diagnostic yield of 42% in infants who have received WGS, consistent with previous reports of similar studies [2]. Additionally, it was found that 69% of the infants who had received a diagnosis by WGS had a change in management following their diagnosis, including: transition to comfort care, initiation of new medications, change in procedures and tests, and recommendations for follow-up specific to the diagnosis. Ongoing analyses and future directions will focus on a comparison of the study population to a control group of infants who were managed with usual care in the two years prior to implementation of WGS technology at URMC. In conclusion, while additional analyses need to be performed, our current study findings provide further data from a real-world setting. These preliminary data suggest that early genetic diagnosis using rapid whole genome sequencing may potentially lead to a change in current management of critically ill infants admitted to the NICU with a suspected genetic disease.

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Immunohistochemical Characterization of Losartan Response in a Patient-Derived Xenograft Model

Background and Rationale: The prognosis of pancreatic cancer is very poor, with an average 5-year survival rate of 10% (1). The most prevalent type of pancreatic cancer is pancreatic ductal adenocarcinoma (PDAC) which accounts for approximately 90% of pancreatic malignancies (2). When PDAC cannot be resected in an individual, chemotherapy is typically offered to the patient. This approach usually provides only modest survival benefits due to some degree of drug resistance (3-4).

PDAC tumors contain an abundant desmoplastic stroma that contains a diverse population of fibroblasts (5). Among these are myCAFs, cells with myofibroblastic characteristics that express high levels of TGF-β (6-7). Activation of the renin-angiotensin system in fibroblasts increases tumor fibrosis and desmoplasia through a transforming growth factor β pathway. Losartan inhibits the renin-angiotensin system by acting as an angiotensin I receptor blocker. Additionally, in animal and human models, losartan has been shown to inhibit the expression and activation of TGF-β1 (8-12). It has been proposed that by blocking the renin-angiotensin-system, losartan decreases TGF-β1 activity, resulting in reduced desmoplasia and enhanced chemotherapy intertumoral penetration (13-14). Preliminary data suggest that total neoadjuvant therapy with FOLFIRINOX, losartan, and chemoradiotherapy is related to the downstaging of locally advanced pancreatic ductal adenocarcinoma (15).

Previous work in the Liss Lab has characterized the stromal content of patient-derived xenograft (PDX) tumors of PDAC which revealed a wide range of myCAF contents. Examining the effects of losartan on PDX tumor growth indicate that myCAF content may serve as a potential therapeutic indicator. Further studies are required to understand how losartan specifically affects both the cancer cells and fibroblasts.

Research Goal: This project is focused on characterizing the effect of losartan on fibroblast content and cancer cell proliferation in a losartan-sensitive PDX model.

Methods: To explore the relationship between losartan, cancer cell proliferation, and fibroblast content, immunohistochemistry (IHC) was performed (Impress Horse Anti-Rabbit IgG Polymer and Impress Duet Double Staining Polymer kits). Antibodies specific to panCK (Cell Signaling #4685S) and Ki-67 (Cell Signaling #9027S) were used to detect PDAC cells and proliferative cells respectively. Fibroblasts were detected with an antibody specific to alpha-SMA (Cell Signaling #19245).

Results: Cancer cells in PDX1275 tumors from control mice (n=3) were highly proliferative, with 54.5% of cytokeratin-positive cells expressing Ki-67. The proliferation of PDAC cells in tumors from losartan-treated mice (n=3) was significantly reduced, with only 42.1% of cytokeratin-positive cells expressing Ki-67 ($p<0.05$). Losartan treatment did not significantly alter the fibroblast content of tumors, with similar levels of alpha-SMA staining observed in the control (9.9%) and treatment (8.0%) groups ($p>0.05$).

Conclusion: This study suggests losartan might inhibit PDAC tumor growth by reducing the proliferation rate of PDAC cells. Understanding the contribution of the stromal environment is essential to developing more personalized treatments for PDAC.

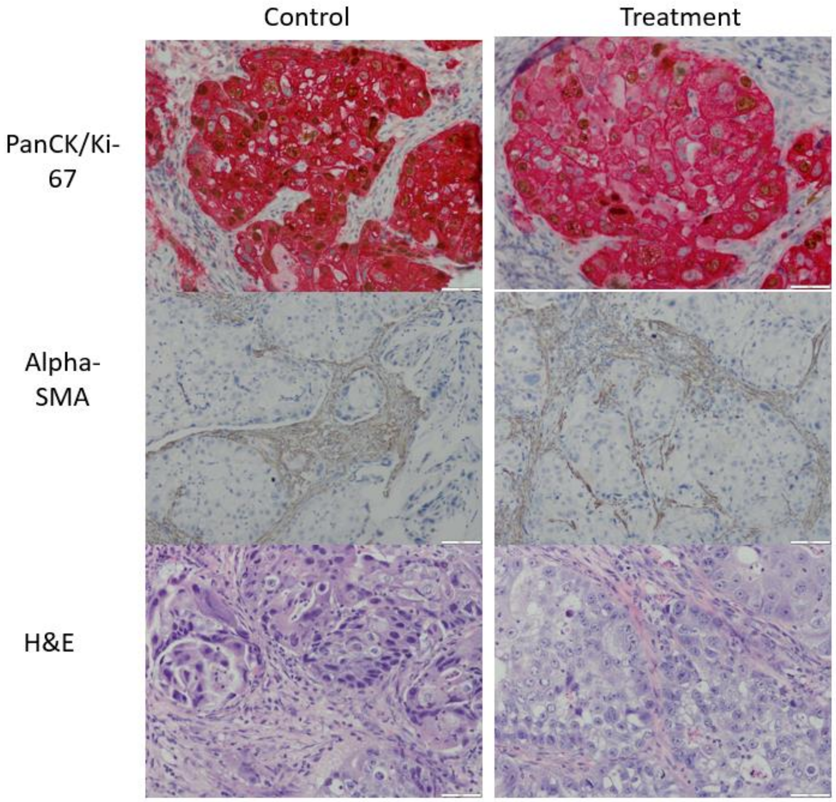

Figure 1. Patient-derived xenograft models for PDAC in control and losartan treated groups characterized by IHC and H&E staining.

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Retinal Activity and Cognitive Functioning in Schizophrenia

Background: The retina is an accessible part of the central nervous system (CNS), mirroring the brain's structure and function in many respects. Abnormalities in retinal cell activity have been associated with several neuropsychiatric pathologies including Alzheimer's disease, Parkinson's disease, multiple sclerosis, and schizophrenia. Retinal cell activity can be measured using flash electroretinography (fERG), with several prior studies showing reduced a-wave and b-wave amplitudes in individuals with schizophrenia (SZ), reflecting pathology in photoreceptors and bipolar cells, respectively. SZ is also associated with neurocognitive impairments, which have been shown to correlate with structural and functional brain changes. Specifically, executive control processes can largely be localized to the prefrontal cortex (PFC). PFC activity may be related to dopamine (DA) metabolism. Consequently, we focused on fERG measurements of oscillatory potentials (OPs), which show dopaminergic amacrine cell involvement.

Objective: In this study, we examined possible relationships between retinal activity and cognitive functioning in individuals with and without SZ. We hypothesized that impairments in oscillatory potentials (OP) (reflected in increased latencies and reduced amplitudes) as measured by fERG would be associated with more impaired cognitive functioning.

Methods: 42 participants (21 SZ; 21 healthy controls) completed an fERG protocol and cognitive test battery. Cognitive tests assessed attention/information processing speed, behavior initiation, response inhibition, and working memory. Associations between OP amplitudes and latencies and cognitive functioning scores were assessed using Pearson correlations and canonical correlations.

Results and Conclusions: Our results suggest that there are no strong associations between OP amplitudes or latencies and cognitive functioning in SZ. This is in contrast to some prior studies showing a correlation between smaller ERG amplitudes and cognitive impairment secondary to neurodegenerative disorders. Relationships between ERG parameters and cognitive impairment may be observable only in more severe cases of CNS atrophy. Further studies of retinal activity and domains of neuropsychiatric symptomatology can elucidate novel methods for symptom assessment and possible pathophysiology.

Also available as Google Doc: https://docs.google.com/document/d/11zJVXw1lzeCCvVscAp-qFGtvKROdo8tRBIsr3goS5LE/edit

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Ethics Consults in the Neuromedicine ICU and Associated Outcomes with Chaplaincy Involvement

Although the biopsychosocial approach has become widely accepted as the modern standard for medical care, a gap persists between religion/spirituality and academic medicine. Despite significant advancements in technology, the Neuromedicine Intensive Care Unit (Neuro-ICU) can frequently provide its patients with unnervingly little certainty regarding medical outcomes. Moreover, quality of stay in the Neuro-ICU is often discussed in terms of in-hospital mortality, length of stay, rates of infections, and other quantifiable metrics. But quality care must consider more than just quantifiable metrics; it considers the patient holistically through ethical principles. These necessitate consideration of religion/spirituality when patients face challenging decisions such as advance directives and decisions regarding life support. Though the supportive services of a chaplain are designed to address such needs, a significant deficiency exists in the literature regarding chaplaincy involvement in ethics consultations and associated patient outcomes in neurology and neuro-critical care.

A qualitative research project designed to examine the experiential perspective of patients who work with a chaplain as part of their care could significantly improve upon current models of patient-centered holistic care.[2] This study will examine the impact of spiritual care consultations on discussions and clinical outcomes centered around goals of care particularly where ethical dilemmas have arisen. This investigation is conducted through retrospective chart review and qualitative thematic analysis of ethical consults in the Neuro-ICU. This allows us to observe the contributions chaplains make in helping patients navigate ethically challenging decisions. Systematic analysis of these narratives has the potential to inform interprofessional collaboration, further elucidating when and why they may wish to solicit the services of a chaplain.[1]

The outcomes of this study can serve to inform physicians on how to better collaborate with chaplains to serve patients more effectively, and can help inform patient resource management and suggestions for considering chaplain care in patients with ethically distressing prognoses.

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Narratives of Pain in Adolescents with Sickle Cell Disease

Background

Bias, stigmatizing language, and social isolation are significant barriers to the optimal care of pain for adolescents and young adults (AYA) with sickle cell disease (SCD). Qualitative studies that include first-person narratives of SCD pain are underrepresented in outcomes research but provide valuable information for clinical education and community care models. Here, we present the interim analysis of an ongoing thematic research study that analyzes narrative experiences of AYA patients with SCD and their journeys—both in and out of the healthcare system—with chronic pain.

Methods

In this IRB-approved study, a single semi-structured interview is administered to patients aged 13-21 with sickle cell disease (Hemoglobin SS, SC, and SBeta-Thal genotypes) living in a mid-sized metropolitan center and receiving care at an academic teaching hospital with community affiliates. Patients are offered the opportunity to participate from inpatient units, ambulatory continuity clinics, and community advocacy groups. Interviews are conducted either in-person or remotely according to patient preference, recorded, transcribed, and independently checked for accuracy. The interview includes questions about coping with pain in medical and non-medical settings, interactions with the healthcare team, impacts of pain on social and community life, and opportunities to describe what they wished family members, teachers, friends, and healthcare providers understood about living with SCD pain. Transcripts are analyzed for thematic coding by 2 independent coders using a deductive approach with latent textual analysis (Braun and Clarke, 2013). Codes are translated into themes by key-words-in-context and indigenous categorization methods (Ryan, 2011). Study team members performing thematic coding are not members of the patients' clinical care teams, and patients do not provide interviews during acute pain crises.

Results

At the time of abstract submission, 8 interviews were completed and analyzed for thematic coding. The median patient age was 17 years. Concordant coding revealed **five primary themes: the relationship between acute and chronic pain, coping with rituals and cycles of care, the unpredictable nature of pain, navigating a biased healthcare system, and social isolation**. The majority of patients detailed their experiences with intense, coexistent physical and emotional pain (6/8) that creates a pervasive sense of uncertainty and foreboding (4/8) in their lives. They described navigating a healthcare system that is difficult to understand, while experiencing doubts and dismissals of their pain from healthcare providers, particularly when making the transition to adult care (4/8). Lack of education and awareness about SCD in academic settings (5/8) and "missing out" on social milestones and norms (6/8) were cited as sources of isolation and emotional fatigue. Having an advocate, in the form of a family member or community-based care advocate, was viewed as a critical source of support within both the health system and community (4/8).

Discussion and Future Directions

This ongoing qualitative research study in adolescent and young adults with SCD provides narrative data about the lived experience of sickle cell pain from the patient perspective. Interim analysis suggests several locations in the care trajectory where patient reports of sickle cell pain may be particularly vulnerable to bias: in healthcare settings for management of acute-onset pain crisis, in schools and other academic support settings where knowledge of SCD may be incomplete, and in the transition of care from pediatric to adult care models. Particularly during acute pain management and transition care experiences, patients described the use of stigmatizing language—in conversation and in the electronic health record—that contributed to feelings of isolation, frustration, and emotional suffering. Results of this study are being used to inform community, pastoral care, and school-based sickle cell education programs, as well as novel medical education curricula aimed at reducing stigmatizing language in the electronic health record. They will also be used to develop standard criteria for sickle cell patient advocates, and to improve funding infrastructure for the formal integration of patient advocates into sickle cell care teams. Future research will measure the impact of participation in this study on pain management outcomes and attitudes toward engaging the healthcare system for routine care and potential SCD clinical research.

Themes	Subthemes	Example Codes	Frequency
Relationship between acute and chronic pain	Intense Physical Pain	Excruciating and horrendous pain Pain in specific areas of the body	6/8
	Emotional Pain	Stress and exhaustion from pain Feelings of frustration, sadness, and anger	4/8
	Progressive Pain	Increased pain episodes Increased hospitalizations	2/8
Cycles of Care		“Constantly taking medications” “Transfusions every month”	5/8
Unpredictable Journey	Sense of Foreboding	“Unpredictability” “Sudden onset of pain”	4/8
	Perseverance	“Stay-strong mentality” “Constant battle”	5/8
Navigating a Challenging Care System	Doubt and Marginalization	“Disbelief from providers” “Dismissal” by providers “Refusing to listen to me”	4/8
	Difficulty with Transition	“Negative attitudes from adult providers compared to pediatrics” “Increased wait times in adult clinic and emergency”	2/8
	Lack of Awareness	“Lack of experience with SCD patients in adult medicine” “Lack of awareness’ from adults in school settings	3/8
	Patient Advocacy	Advocates as providers or family members Increased understanding in the presence of an advocate	2/8
Isolation	Unrelatable Aspect of Pain	Pain being “indescribable” “Not fully understandable unless you have SCD”	4/8
	Isolation from Social Life	“Missing out due to pain and hospitalizations” Separation from “normal” teenagers and teenage life	6/8
Community Support		Local community groups Friends who have SCD	4/8

Table 1: Key themes derived from concordant narrative codes. Frequency denotes the number of interviews/total interviews in which a code appears via key-words-in-context.

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Voxel-based Lesion Activity Mapping of the Brain Networks Supporting Language Fluency

Classical neuronal models of language assert the importance of two regions in the frontal and temporal association cortices in the dominant, usually left, cerebral hemispheres. According to these models, Broca's area, located in the inferior frontal gyrus (BA44 and BA45) is involved with motor-planning aspects of expressive language and is necessary for fluent speech. Wernicke's area, located in the posterior superior temporal gyrus (pSTG), is involved with auditory processing and is necessary for understanding language. White matter fibers connecting Broca's and Wernicke's, termed the arcuate fasciculus, supports the complex process of translating heard communication into an appropriate response.

This paradigm leads to the prediction—and the primary hypothesis—that damage to Broca's area will be associated with a reduction in the fMRI blood oxygen level-dependent (BOLD) signal in the pSTG. This hypothesis rests on the observation that brain lesions not only affect processing local to the site of injury but can also affect processing in anatomically distant areas that depend on the damaged area for their normal functioning. However, in rebuke to the above hypothesis, recent evidence suggests that language deficits typically associated with lesions to Broca's area—namely, impaired fluency—localize more reliably to ventral sensorimotor cortex (vSMC), supramarginal gyri, and subcortical white matter adjacent to these gyri. These structures are traditionally thought to represent face and vocal tract articulatory networks (Andrews et al, 2022). This generates an alternative hypothesis—that lesions to vSMC will be associated with reduced BOLD signal in the pSTG.

Voxel-based lesion-activity mapping (VLAM) is a technique that uses the BOLD signal in one area of the brain as a readout of whether that area's processes depend on inputs from an anatomically distant area that is lesioned. In a VLAM analysis, a correlation coefficient is produced that tests, for a group of patients, where lesion presence is inversely related to the amplitude of the BOLD signal in a region of interest during a specific task. An inverse relation indicates that the presence of a lesion in one region is associated with a reduction of the BOLD signal in a second region (Garcea et al, 2019). We conducted a retrospective VLAM analysis to investigate where lesions predict reduced BOLD signal in the pSTG during a language task.

Whole-brain, pre-operative fMRI data was collected a priori in 38 participants with brain tumors while performing a modified language and music task (Garcea et al, 2017). Data was de-identified and converted to BIDS format for long-term data archiving and sharing, supporting open and transparent scientific practice. fMRI pre-processing included linear trend removal, 3D motion correction, and slice-scan time correction. The first derivatives of 3D motion correction were treated as regressors of no interest to control for head movement.

Simultaneously, lesions were drawn on each participant's high resolution T1 anatomical image using neuroimaging software. The accuracy of the participants' lesion drawings was verified by a neuroradiologist.

Next, an analysis was performed whereby lesion location was correlated with the BOLD signal in the pSTG. Spearman correlation values were generated in each voxel of the brain with lesion coverage of at least ten percent of the sample (3 participants). Preliminary results show that lesions in the left vSMC are significantly associated with reduced BOLD signal in the left pSTG. Importantly, no such association was found between Broca's area and the pSTG. These findings are consistent with the alternative hypothesis and recent evidence suggesting that connectivity between the vSMC and pSTG, rather than between Broca and pSTG, is more critically involved with translating auditory information into fluent speech.

Future directions include adding more participant data into the analysis to ensure the preliminary results are replicable when including a larger sample size. These analyses will support the broader research objective to determine whether cortical regions supporting language fluency localize to posterior structures in the left sensorimotor cortex.

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The Seychelles Child Development Study of the association between childhood vitamin D intake and development of ADHD phenotypes

Background

Attention-deficit with hyperactivity disorder (ADHD) is a chronic neurodevelopmental disorder with a prevalence of approximately 5% of children in America. There is some evidence that vitamin D may have neurohormonal properties in the brain during development that can influence ADHD phenotypic behavioral. Prior research on vitamin D associations with ADHD development have mostly focused on maternal vitamin D status during pregnancy, showing conflicting results for prenatal maternal vitamin D as a potential risk-reducer for offspring ADHD symptoms. There is little investigation on the role of postnatal vitamin D intake in ADHD development in children and further study of childhood vitamin D status may be a starting point starting point for determining specific postnatal risk or protective factors for ADHD which ultimately may guide interventions.

Objective

This project's aim was to examine the association between early childhood intake of vitamin D and concurrent and prospective presence of ADHD phenotypic behaviors.

Methods

The Seychelles Child Development Study is a prospective, double-blind, longitudinal study of mother-infant pairs residing in the Republic of Seychelles. The Nutrition Cohort 1 consists of 300 consenting healthy pregnant women and their children, enrolled in 2001. Data from 229 children are available for analysis for early childhood vitamin D intake at age 5 and development of ADHD symptoms at ages 5 and 9. Neurobehavioral assessment involved the self-reported parent version of the Child Behavioral Checklist questionnaire for their children at 5 and 9 years of age. Vitamin D exposure was measured from the mothers at the time of enrollment, at 28 weeks gestational age, at delivery, and through the placenta cord. Mothers and teachers completed a self-reported diet journal on behalf of the children when they were approximately 5 years of. Vitamin D intake was analyzed as both a continuous and categorical variable. Multiple linear regression models were used to find correlations between childhood vitamin D intake at 5 years old and behavioral outcomes at 5 and 9 years old.

Results

In almost all the subdomains of CBCL scores, adjusted multiple linear regression models did not detect significance. However, we found significant associations between vitamin D intake and three CBCL subdomain scores at 5 and 9 years of age: Thought (beta=-0.972, SE = 0.338, P value = 0.004), Aggressive (beta=-0.780, SE=0.403, P value=0.053), and Externalized (beta = -0.913, SE = -0.913, P value = 0.049). While the categorical analysis of vitamin D showed no statistically significance with CBCL Externalized subdomain at age 5 years, it is noteworthy that there is a downward trend with the beta values, suggesting potentially some linearity in association or pattern that could be further explored.

Conclusions:

In summary, while we did not find any clear associations between vitamin D intake and overall CBCL outcomes, we did find interesting associations between vitamin D intake and specific subsets of CBCL outcome, in particular a positive correlation between vitamin D intake and more positive Thought, Aggressive, and Externalized behavior. While interpretations from the linear regression model are difficult to discern due to nonlinearity, the highly significant correlation between vitamin D intake and CBCL Thought outcomes may be an avenue for future studies.

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Keratinocyte Differentiation State is a Key Determinant of Viral Susceptibility

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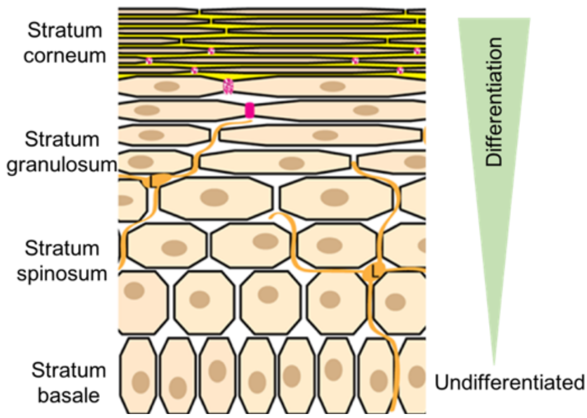

Figure 1. Modified schematic from Brewer et al. (2020) indicating relationship between *in vitro* differentiation state and *in vivo* epidermal stratification.

Keratinocytes (KC), the main cells of the skin epithelium, undergo a process of differentiation to form four distinct layers; the stratum (s) basale, s. spinosum, s. granulosum, and s. corneum (Figure 1). These layers are important factors in skin barrier function and immunity. Our lab previously demonstrated in an *in vitro* KC model that KC were significantly more susceptible to viral infection with vaccinia virus during the first 24 hours of high calcium-mediated differentiation relative to undifferentiated KC or those differentiated for 48 hours (Moran et al. 2021). This project sought to 1) evaluate a greater spectrum of KC differentiation (undifferentiated-96 hours differentiated at 24-hour intervals), 2) determine if this pattern of infection held true using another virus (herpes simplex virus (HSV)-1) and 3) extend these findings to *in vivo* clinical data. To identify which epidermal layer is most susceptible to viral infection, we utilized an immortalized KC line that differentiates in the presence of high calcium and a replication-competent, fluorescently-tagged HSV-1. Human KC were infected with HSV-1 at different stages of differentiation: undifferentiated (low calcium), at the initiation of differentiation (high calcium), and at 24-hour intervals post-differentiation (high calcium). Three days later, infection and replication were quantified via fluorescent imaging. Cytopathic effect was quantified by viral plaques and monolayer clearance. KC infected at the initiation of differentiation showed significantly ($p<0.01$) increased fluorescence ($n=6$) and monolayer clearance ($n=7$) relative to undifferentiated cells or cells differentiated for ≥ 24 hours. This suggests that KC are most susceptible to viral infection during the first 24 hours of differentiation, which is analogous to KC in the lower stratum spinosum (Figure 1). To determine if these findings held true *in vivo*, we evaluated the histopathology of 6 HSV and 12 varicella zoster virus (VZV) skin lesions. In sections where the edge of the viral immunoreactivity was visible, 100% of VZV

(5/5) and 66% of HSV (4/6) cases had viral staining between the stratum basale and granulosum. Collectively, these data suggest that KC that have differentiated to the stratum spinosum level are particularly susceptible to viral infection. This result has implications for dermatological diseases (i.e. atopic dermatitis, Darier disease) with impaired skin barrier function where viral infections cause significant comorbidities.

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Objective: Homelessness is a growing public health concern in the United States, as homeless patients have high rates of chronic mental and physical health conditions, but less is known about their surgical oncologic care.1,2 Therefore, we performed a population-based retrospective cohort study to investigate the 30-day postoperative outcomes and 5-year cause-specific mortality of homeless adults in New York State with potentially curable colorectal cancer.

Methods: In New York, it is legally mandatory to report all incident cases of colon and rectal cancer to the New York State Cancer Registry (NYSCR). Leveraging this, we identified adults with stage I-III colorectal cancer from 2005-2015. The NYSCR links to the National Death Index, which ensures the capture of deaths outside New York. Then patients were linked to the Department of Health Statewide Planning and Research Cooperative System (SPARCS). SPARCS has a variable to identify homeless patients, and a 12-month look-back period was used to identify comorbidities and clinical features. The primary objective was to compare the 5-year cause-specific mortality of housed and homeless patients. Multilevel Cox proportional hazard models accounting for hospital clustering are presented as hazard ratios (HR) and 95% confidence interval (CI). Secondary objectives included comparing the rate of ostomy formation and the 30-day readmissions, complications, and mortality. The odds of short-term outcomes were determined using multilevel logistic regressions accounting for hospital clustering are presented as odds ratios (OR) and 95% CI.

Results: We identified 124,400 individuals with colorectal cancer, and 59,287 (1014 homeless, 58,273 housed) were included. At diagnosis, homeless adults were significantly younger, less likely to be married (33% vs. 51%), more likely to have Medicaid, and a higher proportion identified as Black (41% vs. 12.8%). Homeless patients had significantly higher rates of behavioral and psychotic diagnoses with low rates of other chronic diseases than non-homeless patients. Homeless patients were more likely to undergo non-elective surgery for stage 3 cancer (64.5% vs. 29.6%) and less likely to receive robotic surgeries or care at high-volume rectal or colon cancer hospitals. In the Cox-proportional hazards model, homeless patients had similar odds of colorectal cancer-specific mortality as housed patients (HR 0.89; 95% CI, 0.76-1.05). In mixed effects logistic regression accounting for clustering, homeless patients had lower adjusted odds of receiving an ileostomy (OR 0.62; 95% CI, 0.41-0.93) and similar odds of 30-day complications, readmissions, and mortality.

Conclusion: To our knowledge, this population-based analysis is the largest study reporting oncologic and surgical outcomes of homeless patients. In New York state, the homeless colorectal cancer patients had high rates of Medicaid insurance, presented more acutely, with more advanced cancers, at younger ages, and were less likely to undergo potentially curative surgery at high volume centers for colon and rectal cancer resection. Reassuringly, homeless patients had similar 5-year colorectal cancer mortality rates compared to housed patients after accounting for hospital clustering and stage of the disease. These findings highlight several potential disparities in both the prevention and treatment of colorectal cancer in the homeless population.

Mental health profiles of US adults with co-occurring opioid use disorder and stimulant use disorder

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Declarations of interest: none

Abstract

Background: There were an estimated 108,809 overdose deaths in the United States in 2021, a nearly 20% increase compared to the previous year. Approximately three-quarters of these deaths involved opioids (Ahmad et al., 2022). Drug overdose deaths from cocaine and other stimulants increased by 22% and 50%, respectively, from 2019 to 2020 (Hedegaard et al., 2021). A recent analysis of overdose deaths found that nearly one-third were attributed to combined opioid and stimulant use, and one-quarter were accompanied by documented mental health diagnoses (O'Donnell et al., 2020). In this study, we identified factors associated with co-occurring opioid use disorder (OUD) and stimulant use disorder (SUD), including depression, suicidal thoughts and attempts, and treatment utilization.

Methods: We used data from the 2008-2019 National Survey on Drug Use and Health (NSDUH) to analyze mental health factors associated with co-occurring OUD and SUD. Data from 484,732 respondents were grouped into four categories: no OUD or SUD, OUD only, SUD only, and co-occurring OUD and SUD. We then assessed frequencies for a variety of demographic and health-related characteristics. Adjusted odds ratios were calculated to determine if certain mental health characteristics differed between groups.

Results: Co-occurring OUD and SUD were relatively more common in individuals who were male, younger, White/Caucasian, and less educated. Receipt of substance use treatment was 25.9% for individuals with OUD only and 45.4% for co-occurring OUD and SUD, while receipt of mental health treatment was 40.0% for OUD only and 50.3% for co-occurring OUD and SUD. Individuals with co-occurring OUD and SUD had significantly elevated odds of a past-year major depressive episode (adjusted odds ratio = 1.43) and nearly twice the odds of a past-year suicide attempt (adjusted odds ratio = 1.70) compared to OUD alone.

Conclusions: Individuals with co-occurring OUD and SUD more frequently received mental health treatment and substance use treatment. Despite increased treatment, co-occurring OUD and SUD were associated with higher odds of major depressive episode and suicide attempts. Among these individuals, utilization of treatment services was approximately 50% for both substance use and mental health treatment, suggesting the potential need for treatment programs addressing polysubstance use and mental health concerns.

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Evaluation of mixed reality (MR) technologies for remote education and training on transrectal ultrasound biopsy (TRUS-Bx) simulation: A prospective, randomized, crossover study

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Introduction: Mixed reality (MR) superimposes two simultaneous video feeds enabling remote instruction directly onto a trainee's view. Prior comparative studies have demonstrated the potential for MR in surgical training. Using a validated transrectal ultrasound biopsy (TRUS-Bx) hydrogel model, we sought to evaluate the efficacy of MR-based remote instruction relative to that of in-person (IP) instruction.

Methods: 19 pre-clinical medical students were recruited to complete a TRUS simulation crossover study where guidance was randomized into either MR-first or IP-first groups. The students reviewed pre-learning material prior to TRUS-Bx. Each student completed a pre-test, two training sessions utilizing one modality, mid-test, two training sessions of the opposite modality, and post-test. During test sessions, participants independently measured the prostate and obtained 14 biopsies on a hydrogel model with individually- colored biopsy regions. Accuracy was defined as the percentage of core with the corresponding color for the given biopsy region. During training sessions participants were guided through a TRUS-Bx on single-colored models. MR sessions utilized Zoom to transmit the ultrasound view to the instructor and Vuzix smart glasses to display the superimposed view of the surgical field with the remote instructor's guidance to the participant [Figure 1A-B]. This allowed the instructor to directly annotate on the ultrasound view while guiding trainees with the merged surgical view. Post-training surveys assessed trainee perceptions of the session.

Results: Pre-test core percentages were similar between groups (MR-first: 23.6%, IP-first: 29.0%). Performance on the mid-test following the first two training sessions showed significant improvement (MR- first: 64.8%, IP-first: 58.2%). Post-test core percentages also showed significant improvement in performance from both pre-test and mid-test (MR-first: 79.9%, IP-first: 75.9%) with similar net improvement in core percentages between groups (MR-first: 56.3%, IP-first: 46.9%) [Figure 1C]. Participants found remote training with MR not to interfere with learning.

Conclusion: Remote instruction using MR technology provided equivalent learning to in-person simulation instruction. These results are not only promising for remote learning moving forward, but can also set a new standard for cross-institutional instruction.

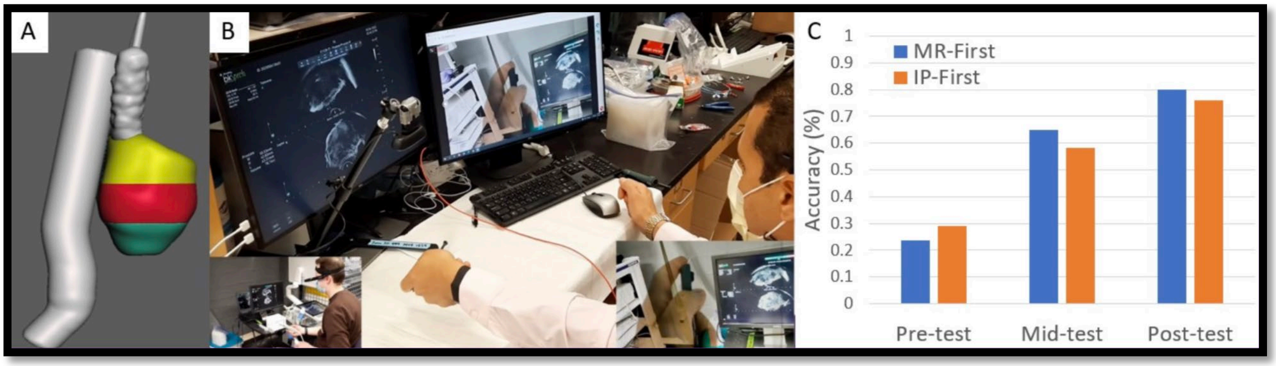

Figure 1

Supportive Care Needs among Asian Americans with Colorectal, Liver, and Lung Cancer from the Patient Cancer Outreach, Navigation, Technology and Support (Patient COUNTS) Study

Katarina Wang

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Background: Cancer is the leading cause of death among Asian Americans, with lung, colorectal, and liver cancers among the top five leading causes of Asian American cancer deaths.[1] Asian Americans may face additional barriers to cancer care, such as limited English proficiency (LEP),[2] and cancer supportive care needs among Asian Americans remain understudied. This study described the cancer supportive care needs among Asian American patients with colorectal, liver and lung cancers and examined factors associated with their needs to offer insights to improve cancer supportive care for this population.

Methods: Participants were 47 Asian American adults with stage I to IV colorectal, liver, or lung cancer identified from the Greater Bay Area Cancer Registry[3] who completed a baseline needs assessment survey during enrollment in Patient COUNTS,[4] a web-based patient navigation program connecting patients to cancer supportive care resources in Chinese, English, and Vietnamese. Cancer supportive care needs were assessed by 15 yes/no items in 4 domains: cancer-specific (6 items including cancer treatment information, nutrition advice for cancer recovery, and coping with side effects); daily living (5 items including financial, legal, transportation, food, and housing); behavioral health (3 items on mental health, alcohol, and smoking); and language (1 item on language assistance). We conducted descriptive statistics, bivariate analyses, and multivariable generalized linear models (GLM) to identify correlates of patient characteristics for each needs domain. Age, gender, ethnicity (Chinese versus other Asians), language (English proficient; LEP but preferred English; LEP and preferred Chinese/Vietnamese), and cancer stage (early stages I/II; late; unknown) were included as a priori covariates in all GLM analyses. Additional covariates were included in the final multivariable models when bivariate analyses met $p \leq 0.20$.

Results: The study sample (45% Chinese, 72% men) had a mean age of 57.6 (SD = 13.2; range: 30-82). Many (62%) spoke English less than very well (LEP), 34% were monolingual Chinese or Vietnamese speakers, and 34% did not attend college. Participants had lung (43%), colon (53%), or liver (4%) cancer at stage I (19%), II (21%), III (26%), or IV (13%), including 21% with unknown cancer stage status. The mean number of needs reported was 6.5 (SD = 4.1). A majority (70%) of participants reported needs in at least 2 domains. The most prominent needs were cancer-specific information, followed by daily living, behavioral health, and language assistance. Cancer-specific information needs were not associated with participant characteristics. GLM revealed that daily living needs were higher in those with annual income <\$50K ($B = 0.34$; $p = 0.02$) but lower among the retirees. Men ($B = 0.23$; $p = 0.02$) and younger participants ($B = 0.01$ $p = 0.02$) reported higher behavioral health needs. Language needs were associated with having LEP and choosing

Chinese/Vietnamese (*B* = 0.23; $p < 0.01$) or English (*B* = 0.31; $p = 0.04$) for program participation or being unemployed (*B* = 3.6; $p = 0.04$). Cancer stage or type were not correlated with the number or types of supportive care needs.

Conclusions: The Asian American cancer patients in Patient COUNTS reported supportive care needs in multiple domains, with cancer-specific information being most prominent. Our findings that some patients' needs were associated with patient characteristics underscore the importance of providing a patient-centered approach to individualize navigation of resources to meet Asian American cancer patients' needs in multiple areas. These findings will inform future interventions to improve the care that Asian American cancer patients receive.

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Mesenchymal Stromal Cell Efferocytosis is Blocked in vitro by Inhibition of Tyro3, Axl and MerTK Receptors

Bone marrow derived mesenchymal stromal cells (MSCs) are a population with multi-lineage differentiation capacity that play an important role in the regulation of the bone marrow niche. While macrophages are the primary phagocytes in the bone marrow, we and others have shown that MSCs are able to act as non-professional phagocytes. Recently, we found that when MSCs clear high levels of dead and apoptotic cells, a process known as efferocytosis, they have increased rates of cellular senescence. Since increased senescence is a mechanism of age-related bone loss, we aimed to block this process of MSC efferocytosis. RNA sequencing data showed that MSCs express Axl and Tyro3, receptor tyrosine kinases that mediate macrophage efferocytosis. Importantly, Axl transcriptional levels were significantly higher than those of Tyro 3 and increased after efferocytosis, suggesting that Axl is the principal receptor mediating efferocytosis in MSCs. However, in mice with global deletion of Axl, MSC efferocytosis is reduced but not completely blocked, suggesting that, while Axl is likely the dominant efferocytosis receptor in MSCs, other receptors may also be involved or may compensate in the setting of Axl loss.

Based on these data, and to determine the translational potential of inhibition of MSC efferocytosis, we assessed the efficacy of small molecule inhibitors of the TAM receptors (Tyro3, Axl, MerTK) on MSC efferocytosis in vitro by testing a specific Axl inhibitor, TP0903, and a pan-TAM inhibitor, LDC1267. Initial studies in ST2 cells (stromal cell line) and primary human MSCs showed low toxicity with treatment of both drugs. Next, we performed efferocytic assays where 1 hour drug-pretreated cultures were challenged with 1:1 and 5:1 ratios of human neutrophils to MSCs. These studies showed that, 3 hours after neutrophil addition, neutrophil uptake by MSCs was significantly reduced by both drugs. At 24 hours after neutrophil addition, global TAM inhibition blocked MSC efferocytosis without changing cell viability. However, unexpectedly, Axl inhibition alone brought MSC efferocytosis back to its baseline levels at 24 hours, suggesting that there is compensatory Tyro3 and/or MerTK upregulation when Axl is inhibited. Pan-TAM inhibition, on the other hand, functionally eliminates MSC efferocytosis at 24 hours.

Our data demonstrate that TAM receptors are critical mediators of MSC efferocytosis. Moreover, we show that inhibition of the TAM receptors reduces MSC efferocytosis in vitro, and identify compensatory TAM dynamics that may account for the partial loss of MSC efferocytosis in mice lacking Axl. These results demonstrate a targetable mechanism of MSC efferocytosis that may have clinical significance in the treatment of age-related bone loss and other diseases caused, at least in part, by efferocytic excess.

YEAR-OUT RESEARCH

Correlation of PROMIS to SRS-22r in Surgical Adult Deformity Patients: An Analysis of 187 Visits

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Hypothesis: SRS-22r obtained prior to and following adult spinal deformity surgery will exhibit a strong correlation with the Patient-Reported Outcomes Measurement Information System (PROMIS).

Study Design: Retrospective cohort study performed at a single academic medical center.

Introduction: Adult spinal deformity patients often undergo extensive surgeries with high complication risks. Patient-reported outcomes (PRO) such as SRS-22r can provide greater insight into the impact of the surgery beyond radiographic measures. Our objective is to evaluate the correlation of the SRS-22r to the PROMIS, which uses computer adaptive technology (CAT).

Methods: PROMIS was adopted in our Orthopedic department in April 2015. Adult scoliosis patients who underwent complex spinal deformity surgery between 10/2013 to 12/2020 at a single academic medical center were enrolled. Patients having surgery prior to April 2015 only completed post-operative PROMIS and SRS-22r questionnaires. All other patients completed both the PROMIS and SRS-22r questionnaires during their pre- and post-operative visits. The following PROMIS domains—Physical Function (PF), Pain Interference (PI), and Depression were completed. PROMIS domains were compared to scores within the SRS-22r Function, Pain, and Mental Health domains, respectively. Spearman correlation (ρ) coefficients were calculated, and the absolute value of each correlation was taken for ease of analysis. Significance was set at $p< 0.05$.

Results: A total of 187 unique visits and 55 procedures representing 49 unique patients met our inclusion criteria. A majority were female (37; 76%) and Caucasian (43; 88%). The average age was 66 years (range: 21-81) and the average follow-up was 12.9 months (SD 12.8). Moderate correlation existed between PROMIS PF and SRS Function domains ($\rho = 0.53$, $p< 0.0001$; $n = 121$) and between PROMIS PI and SRS Pain domains ($\rho = 0.58$, $p< 0.0001$; $n = 121$). PROMIS Depression and SRS Mental Health domains demonstrated a strong correlation ($\rho = 0.84$, $p< 0.0001$; $n = 117$). PROMIS demonstrated negligible ceiling and floor effects for all domains (range, 0.44% to 8.04%). Although the ceiling effect was larger for SRS domains (range, 1.07% to 35.39%), the floor effect was not as pronounced (range, 0.54% to 3.93%).

Conclusions: PROMIS PF, PI, and Depression domains capture similar clinical insight as the SRS-22r Function, Pain, and Mental Health domains. Thus, spine surgeons can consider using these PROMIS domains as an alternative to SRS-22r to follow adult deformity patients pre- and post-operatively.

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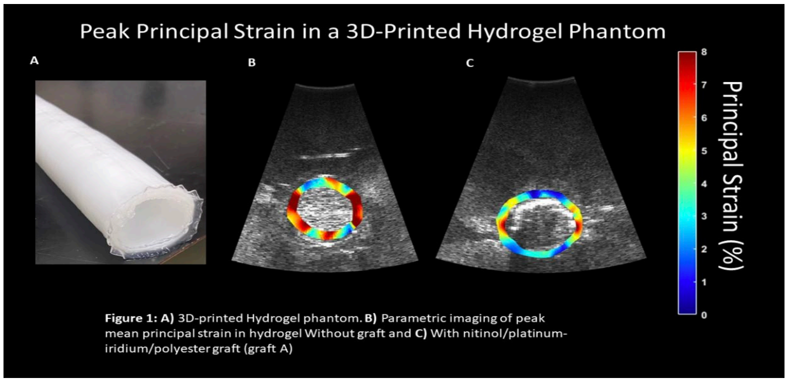
Ultrasound Elastography to Quantify Pressure Normalized Strain Reduction Associated with Different Aortic Endografts in a 3D-Printed Hydrogel Phantom

OBJECTIVE: Recent literature has shown that strain may be useful in evaluating stability of abdominal aortic aneurysms (AAA) following endovascular aneurysm repair (EVAR). With the numerous options available for choice of endograft and little data to assess the efficacy of different graft compositions, it is useful to quantify the magnitude of strain reduction associated with different grafts. Here, we measure pressure normalized strain associated with different endografts in a hydrogel phantom using our novel ultrasound elastography (USE) technique.

METHODS: A homogenous 10% by mass polyvinyl alcohol cryogel (PVA-c) 3D-printed phantom (Figure 1.A) with a 28 mm diameter was connected to a cardiac flow simulator and imaged after implantation with four different 30 mm EVAR grafts using USE (Figure1.B). Graft compositions were nitinol/platinum-iridium/polyester (A), polyester/stainless steel (B), PTFE/nitinol (C), and polyester/electropolished nitinol (D). Mean principal strain (*ep+*) was measured three times in the main body of each graft. The strain values for each trial were then normalized by dividing by pulse pressure to yield pressure-normalized strain (*ep+*/pp). This procedure was repeated for the phantom with no endograft in place (NOG). Separate paired two tailed T-tests were performed comparing *ep+*/pp in the phantom with no graft to the different *ep+*/pp values obtained from the phantom with each individual graft.

RESULTS: There was a statistically significant reduction in the average *ep+*/pp for each graft compared to the phantom with no graft (**NOG**: 0.946 ± 0.019%/kPa, **D**: 0.739 ± 0.047%/kPa; p= 0.028, **B**: 0.733±0.067%/kPa; p= 0.040, **C**: 0.649±0.086%/kPa; p= 0.035, **A**: 0.599±0.031%/kPa; p= 0.006). There was a significant difference between graft D and graft A (p=0.013) *ep+*/pp which was not present for the other grafts.

CONCLUSION: This study demonstrates the ability of USE to measure *ep+*/pp associated with different endografts in a 3D-printed vessel phantom. Our data suggest that there is a significant difference in the absolute value of strain between graft manufacturers. Further exploration is needed to determine if this is clinically significant.



Peak Principal Strain in a 3D-Printed Hydrogel Phantom

Figure 1: A) 3D-printed Hydrogel phantom. **B)** Parametric imaging of peak mean principal strain in hydrogel Without graft and **C)** With nitinol/platinum-iridium/polyester graft (graft A)

An Evaluation of Health Inequities and Disparities in the Evaluation and Management of Acute Coronary Syndrome in the Prehospital Setting

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Background: Biases in healthcare can be detrimental, as they can lead to poor patient outcomes that disproportionately affect specific populations based on certain demographics that do not represent the majority. However, few studies have shown statistical evidence to prove these biases exist; therefore, no policies or additional training are offered to medical providers to address them. This study looks at EMS (Emergency Medical Services) provider decision-making for patients with Acute Coronary Syndrome (ACS) symptoms to identify any biased administration of life-saving interventions. ACS is a fatal condition experienced by millions annually; thus, establishing prophylactic and early intervention measures was necessary to detect ACS in a patient sooner, decreasing door-to-balloon time to treat and stabilize ACS patients.

Purpose: The project aims to explore disparities and inequities in the acute management of cardiac conditions, including acute coronary syndrome (ACS) and out-of-hospital cardiac arrest (OHCA). Research is limited to numerous components of the clinical management of these patients and how patient-level factors, neighborhood characteristics, and social vulnerability influence the clinical care provided and resulting patient outcomes.

Patient and Methods: For this study, a planned retrospective electronic record chart review is the method of choice for manually collecting variables from ACS-confirmed patients who are >/= 18 years of age from 1 January 2019 to 31 December 2019. Researchers follow an abstraction guide that lists the criteria and specifics for the variables collected for each patient. There are three categories of variables, which include: Demographic, Clinical, and Quality Indicators. Demographic variables include race, ethnicity, sex, BMI, employment, insurance, and zip code. Clinical data variables include comorbidities, initial vital signs, signs and symptoms, and EMS dispatch code. Quality Indicators include 12-Lead EKG testing, Aspirin administration, and prenotifications.

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URSMD Class of 2023

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Autonomy and other social factors related to postpartum morbidity in Latin America

Background

Postpartum morbidity is understudied globally, and this is especially true in Latin America. In 2021, the WHO launched five global targets for 2025, including for 80% of birthing individuals to have access to postnatal care within two days of delivery, 90% of pregnant individuals to attend at least four antenatal visits and 65% of women to be able to make informed decisions regarding contraception, sexual relations and reproductive health. Pursuing a better understanding of maternal morbidity, its predictors and associated social situations could significantly reduce maternal health disparities and reduce maternal mortality worldwide.

Objective

Our objective with this study is to better understand the relationship between women's autonomy and postpartum morbidity by examining correlations between various social factors and increased postpartum morbidity.

Study Design

This study used data from surveys and focus groups conducted through the MundoComm study at urban and rural sites in the Dominican Republic, Costa Rica and Honduras. Surveys and focus group transcripts were translated from Spanish into English for analysis. Analysis was completed using IBM SPSS Statistics software. Postpartum complications reported by study participants included pelvic pain, dysuria, signs and symptoms of infection, postpartum hemorrhage, retained placenta, postpartum depression, fistula formation and other complications.

Results

In Costa Rica, younger age, food insecurity, hypertension in pregnancy and living with a partner were associated with increased risk of postpartum complications. In the Dominican Republic, younger age, hypertension in pregnancy, living with a partner and unplanned pregnancy were associated with increased risk of postpartum complications. In Honduras, low social support, food insecurity and a partner who helps them make health-related decisions were associated with increased risk of postpartum complications. Trusting healthcare workers to help with health-related decisions was associated with decreased risk of postpartum complications for participants in Costa Rica only; no association was observed in data from the Dominican Republic or Honduras.

Conclusions

Our research indicates that several social circumstances may be related to postpartum health outcomes. Further studies should examine these interactions, as postpartum morbidities are understudied globally but are known to negatively affect women's physical and mental health, potentially affect economic output and ultimately contribute to maternal mortality. At the same time, trusting healthcare workers might have a protective effect against postpartum morbidity, but this was only seen in this study in Costa Rica, which has a relatively well-funded and developed primary care national network. Further study into this phenomenon is warranted in order to further global health efforts for improved health outcomes and particularly improved maternal health outcomes.

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Looking through the Yellow Pages…: experiences of hearing parents with their child's hearing loss

Access to language and a robust communication system is important for the cognitive, linguistic, and social-emotional development of all children. deaf/Deaf and Hard-of-Hearing (d/DHH) children encounter particular challenges to language access, as the majority are born to hearing parents who often have little experience with hearing loss. These parents rely on outside sources for information and guidance as they navigate important decisions that impact their child's future. In this study, we focus on exploring three aspects of parental experiences encountered by hearing parents with a d/DHH child: emotional experiences after hearing loss identification, barriers to early and adequate language exposure, and facilitators of early and adequate language exposure. The hearing parents of 18 d/DHH children from across the US participated in qualitative, semi-structured interviews. The children ranged in age from 6 to 41 at the time of parent interviews. Families used diverse communication approaches that they adapted over time. Data collection occurred over the span of one year, and transcripts were analyzed using a thematic analysis approach. The interview design of this study allowed for rich data collection that supported deep exploration of parental perspectives. A central emotional theme identified the expectations set by healthcare providers as "not setting up the parents for success." Common themes of barrier experiences included the decentralization of services and stigma surrounding communication-related decisions. One family noted resorting to "looking through the Yellow Pages to find an audiologist" due to the lack of initial guidance that they received. Themes identified about facilitative experiences included having a trusted central service provider and prior engagement with d/DHH communities; "having the advantage of the insight from Deaf adults is worth its weight in gold." Identifying parent perspectives is critical for informing interventions and social supports for d/DHH children, and for facilitating future parent-to-parent interactions. We view these results as important guideposts for improving support infrastructure.

Single-Cell Analysis of Human Hip Synovium

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Mentors: Brian D. Giordano, M.D. and Chia-Lung Wu, Ph.D.
Study conducted at the University of Rochester

INTRODUCTION:

Osteoarthritis (OA) is the most prevalent degenerative joint disease. The global economic and quality of life burden is substantial and expected to increase with an aging population[1]. Femoroacetabular impingement (FAI) is an acknowledged precursor for hip OA. FAI is marked by an incongruent femoral head and acetabulum, which can lead to abnormal contact forces and subsequent joint damage. Cam-type FAI, an asphericity of the femoral head, is particularly associated with OA development and is thus a valuable pre-disease model for hip arthritis[2,3]. Hip arthritis is best viewed as a whole-joint disease. Such a view connotes, in addition to the hallmark cartilage degeneration, synovial inflammation and hyperplasia, ligamentous laxity, and subchondral bone dysmorphia[1]. However, efforts to date to study the synovium in arthritis have focused largely on knee synovium, and in particular knee synovium in the setting of rheumatoid arthritis. The present study sought to evaluate the synovium in patients with FAI and those with OA. Single-cell transcriptomic methods (scRNA-seq) were used to identify cellular identity and expression patterns in synovial tissue in the two disease states. To our knowledge, our group is the first to produce these results.

METHODS:

Four patients were included in this study – one patient for the OA cohort, and three for the FAI cohort. The sample size was limited due to the stringent selectivity of our criteria, the novelty of and technical challenges with the method, and logistical concerns such as cost. OA patients were undergoing total hip arthroplasty and FAI patients hip arthroscopy. All patients had cam-FAI morphology. Patients with any history of traumatic injury to the joint, diabetes, rheumatoid arthritis or other inflammatory condition, a smoking history within the last year, and previous surgery to the joint were excluded. Tissue was digested for scRNA-seq and submitted to UR Genomics Research Center (10x Genomics). Cell populations and differentially expressed genes (DEGs) were identified via bioinformatics platforms including Seurat, Monocle, RcisTarget, and CellChat R Packages. Cell subsets were identified via functional analysis.

RESULTS:

Initial analysis was conducted separately for the two disease states. Sixteen distinct populations of cell clusters were identified for the FAI pool including fibroblast, T-cell, and myeloid populations (Figure 1). Sixteen populations of cell clusters were identified for the OA pool as well, including myeloid cells, NK cells, fibroblasts, and endothelial cells (Figure 2). Pooled analysis focused on myeloid populations revealed 10 populations of cell clusters (Figure 3). Of these, 3 showed substantially different composition according to disease state (i.e. one cluster composed of notably more cells from OA versus FAI), most notably cluster 0 and cluster 4. DEG analysis showed increased inflammatory markers for cluster 0 (Figure 4), while functional analysis demonstrated increased expression of genes involved in cartilage catabolism and extracellular matrix breakdown (Figure 5). Cluster 4 similarly displayed increased expression of pro-inflammatory genes (Figure 6). However, functional analysis implied dendritic cell function, with increased expression of genes involved in antigen presentation (Figure 7).

DISCUSSION:

To our knowledge, the results presented here are the first successful scRNA-seq analysis of human hip synovial tissue. In addition to its novelty, the work is significant for the rich dataset produced. Initial analyses focused on myeloid populations. Cluster 0, composed predominantly of OA synovial cells, represented a pro-inflammatory myeloid population likely involved in cartilage degradation. This is logical given that cartilage breakdown is a hallmark feature of osteoarthritis. Cluster 4, composed predominantly of FAI cells, appeared to represent a dendritic, or antigen-presenting cell population. This is slightly more difficult to characterize. It may be that this population depicts the initial inflammatory response to tissue and cellular damage in FAI. Further analyses to better define this population and others are underway in our lab., as well as integration of this data with spatial transcriptomic data. Additionally, our lab has recently submitted abstracts detailing our analyses of the non-hematopoietic populations, coupled with integrated spatial transcriptomic data.

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FIGURE 1

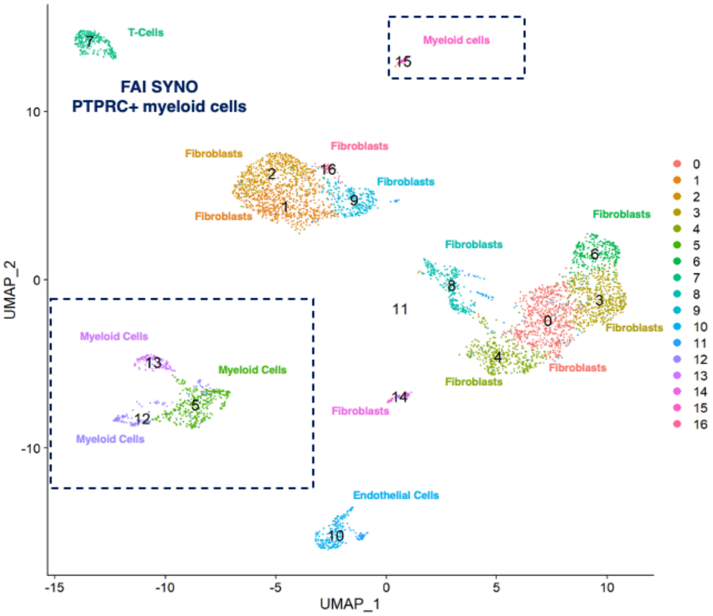
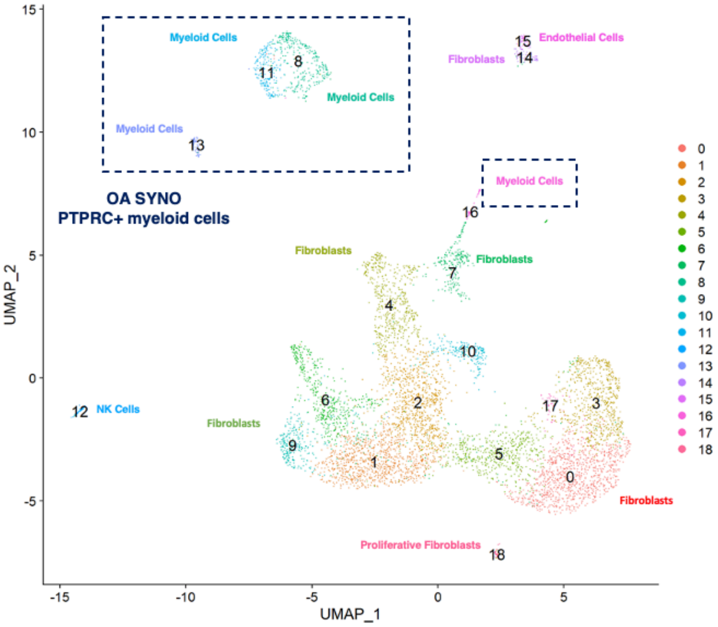


FIGURE 2



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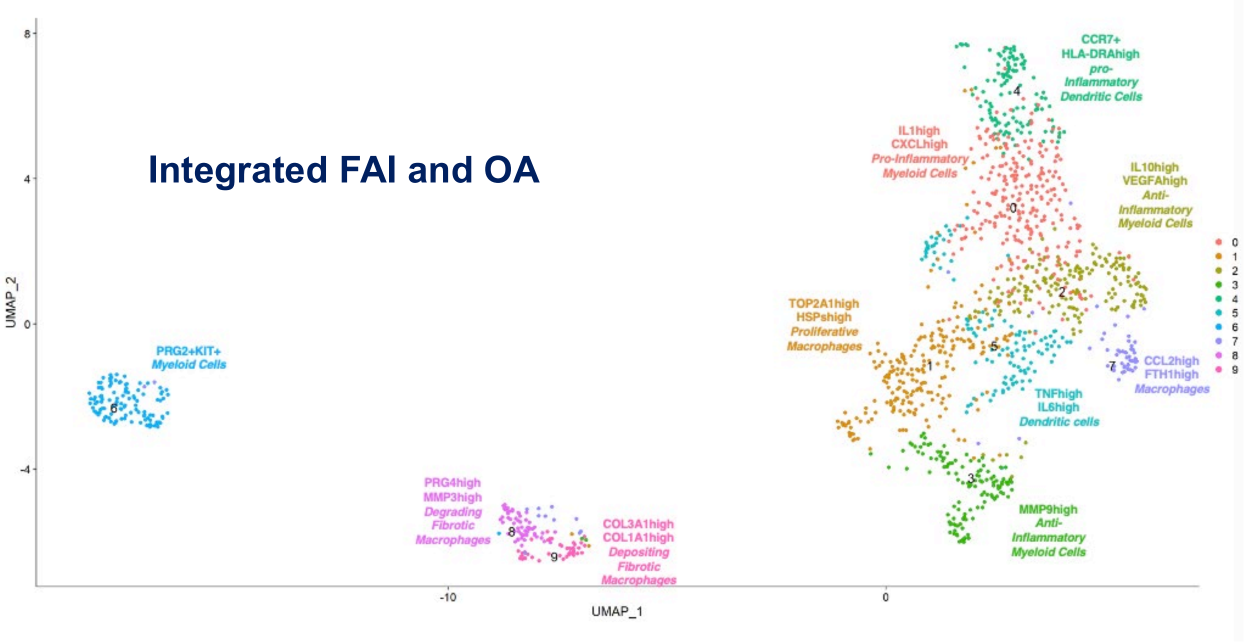

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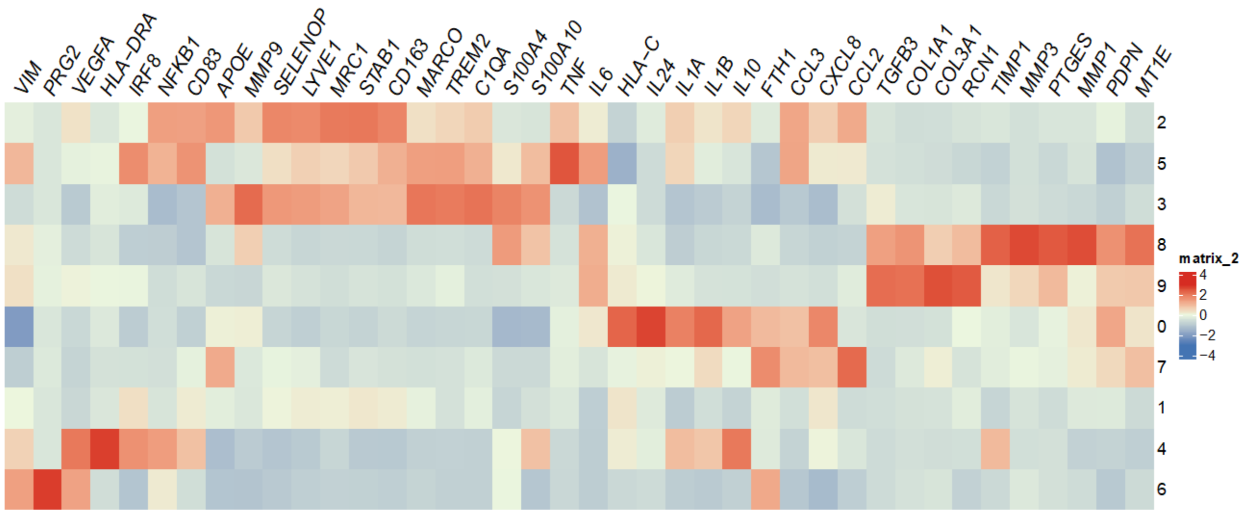

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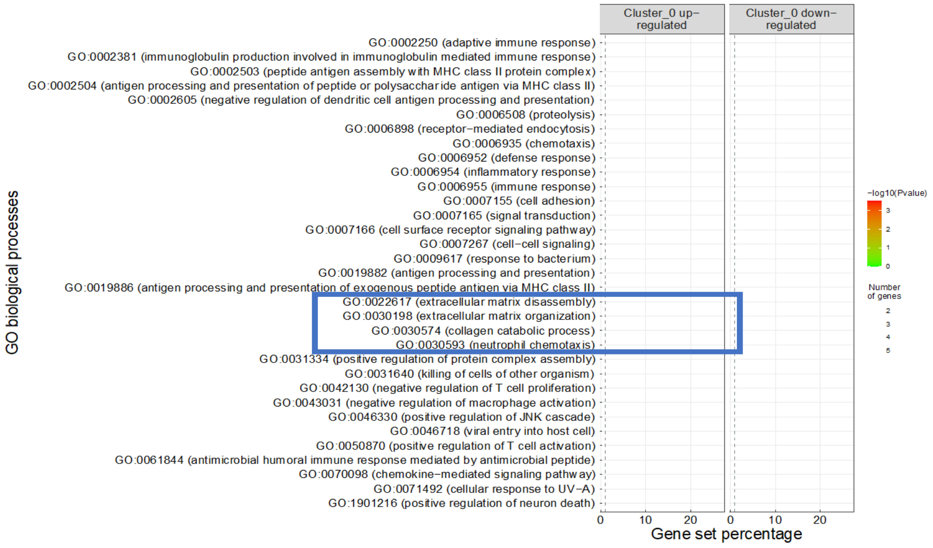

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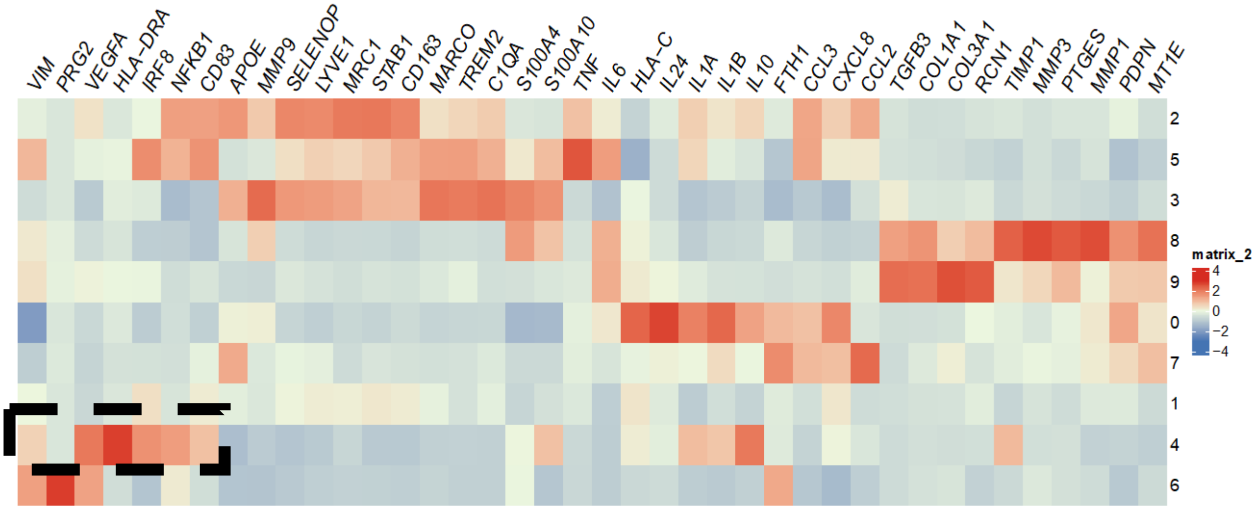
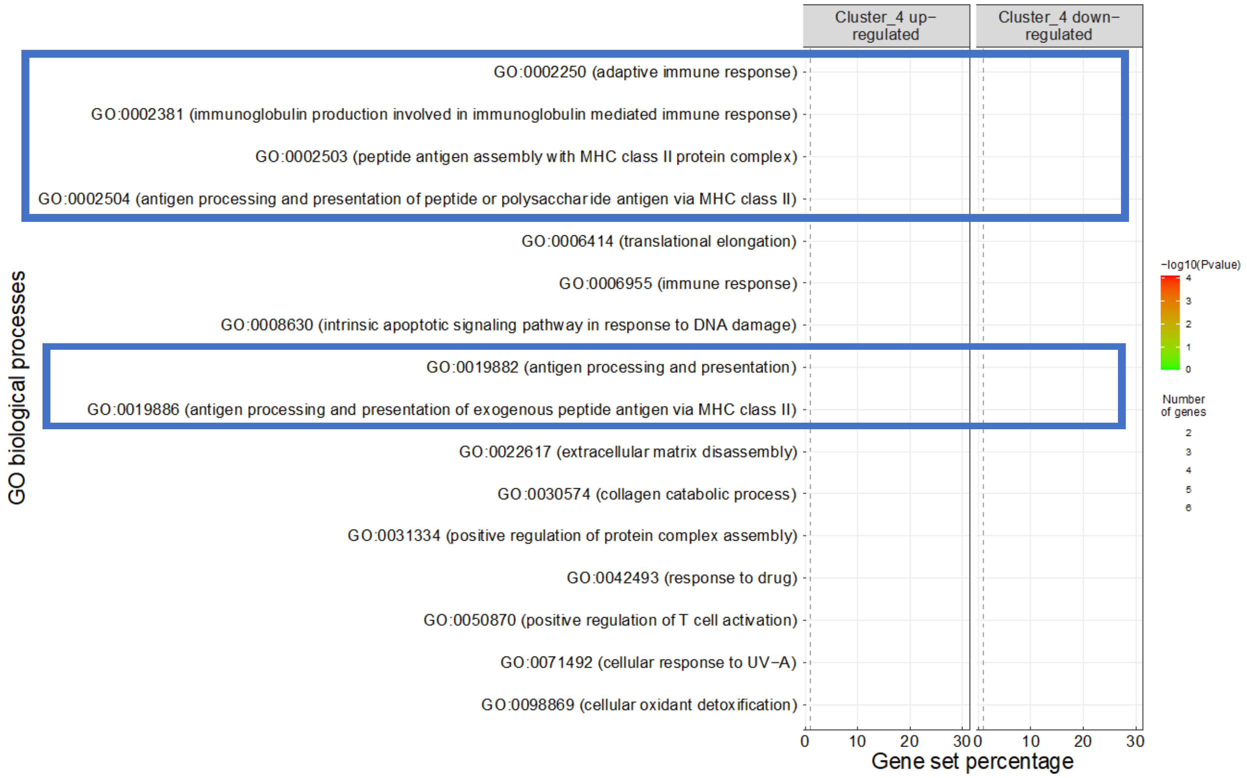


FIGURE 7



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A pilot randomized trial of an intervention to prevent post-partum depression in antepartum patients admitted for prolonged hospitalization

Background: Pre-eclampsia, preterm prelabor rupture of membranes, placenta previa, and other high-risk complications of pregnancy are often exceptionally stressful and can lead to the recommendation for long-term inpatient hospitalization. Pregnant individuals who experience these high-risk complications are at an increased risk for onset of perinatal mood disorders or exacerbation of underlying mood disorders.

Objective: To evaluate the feasibility, acceptability, and explore the utility of a low-cost, low-resource, interpersonal therapy, and psychoeducation-based intervention to prevent postpartum depression in a population of antenatal patients admitted for prolonged hospitalization for Obstetric complications.

Methods: A pilot randomized controlled trial of pregnant people (20 – 35 weeks) admitted for Obstetric complications with an expected hospital length of stay expected to exceed 7 days before delivery or discharge. Recruitment occurred from July 2021 - March 2022 at a single academic center in New York State. Twenty-seven people were randomly assigned to receive the intervention (n=14) or treatment as usual (n=13). Four antenatal sessions and one postpartum session of the standardized program were performed by a single interventionist for participants allocated to receive it. Acceptability of the intervention was assessed using a validated client satisfaction tool and standardized ratings surveys. A structured diagnostic interview for depression, and screening assessments for depression, anxiety, and perceived stress, were administered at baseline, post-intervention, and at 6 weeks postpartum to assess for trends in changes in diagnosis and symptoms of these mood and anxiety disorders.

Results: Participants were white (74.1%), non-hispanic (85.2%), ≥ college educated (51.9%), employed (77.8%) with a mean antenatal length of stay of 27.3±16.9 days and delivery at a mean gestational age of 33.0±2.7 weeks. Feasibility was demonstrated by effective screening rate (52.9%), enrollment rate (76.3%), retention rate (60%), and follow-up rate (92.6%). Intervention participants reported high levels of satisfaction with the program on validated assessment (mean score 30.9±1.7 of 32 possible points). At 6 weeks postpartum, there was a statistically significant decrease symptoms of depression in ROSE participants compared to treatment as usual (mean Edinburgh Postnatal Depression Scale score difference, ROSE: -8.1 ± 6.1, Treatment as usual: -1.7± 5.4, p=0.01). There were no significant changes in measures of anxiety or perceived stress over time between groups.

Conclusion: The findings of the current study are encouraging that a low-resource, low-cost intervention delivered by non-specialists with brief training can be successfully implemented on inpatient antenatal units and suggests it may be useful as a preventive intervention for postpartum depression. A larger, powered, clinical trial with a more diverse sample population, adaptations of trial inclusion/exclusion criteria and adaptations of program content to better suit the needs of inpatient participants is warranted to expand upon these preliminary findings.

Title: Association of Mineralocorticoid Receptor Antagonists Use with Mortality and Arrhythmic Risk in Patients with Implantable Devices: a sub-study of the MADIT Trials

Mentors: Dr. Himabindu Vidula, Dr. Ilan Goldenberg

Clinical Cardiovascular Research Center, University of Rochester School of Medicine and Dentistry

Authors: Ramya Sampath, Anita Y Chen, Scott McNitt, Alex Diamond, Mehmet Aktas, Valentina Kutyifa, Hillel Steiner, Milica Bjelic, Wojciech Zareba, Ilan Goldenberg, Himabindu Vidula

Background: Patients with Implantable Cardioverter-Defibrillators (ICD) and Cardiac Resynchronization Therapy Devices (CRT-D) have improved outcomes on optimal Guideline-Directed Medical Therapy (GDMT), yet few studies have focused on the impact of mineralocorticoid receptor antagonists (MRA) on mortality and arrythmia risk in patients who may be unable to tolerate optimal GDMT.

Objective: The purpose of this study was to assess the impact of MRA on all-cause mortality and ventricular tachyarrhythmia (VTA) in patients with ICD or CRT-D who were not treated with both ACE-inhibitors/Angiotensin Receptor Blockers (ACE/ARB) and Beta Blockers (BB) in 4 MADIT (Multicenter Automatic Defibrillator Implantation Trial) and Ranolazine in High-Risk Patients with Implanted Cardioverter-Defibrillator (RAID) studies between 1997-2015.

Methods: We included 5504 patients in 5 landmark ICD clinical trials categorized by MRA use in addition to baseline BB or ACE/ARB use. Cox proportional hazard regression models and Fine and Gray regression models, stratified by studies, were performed to assess the association between time-dependent MRA use and risk of all-cause mortality and VTA. VTA was defined as any treated or monitored sustained ventricular tachycardia (VT ≥170 bpm) or ventricular fibrillation (VF). Patients were categorized into subgroups of those who were prescribed both BB and ACE/ARB (2-drug GDMT) and those who were prescribed only one of the two drugs (1-drug GDMT) at enrollment.

Results: Among 5504 study patients, 4392 (80%) were prescribed 2-drug GDMT and 1016 (18%) were prescribed 1-drug GDMT. MRA was prescribed to 1656 (30%) patients. Multivariate analysis demonstrated that MRA use was associated with a 52% reduction in the risk of mortality in patients prescribed 1-drug GDMT (HR=0.48 [95% CI: 0.27-0.86], p=0.014), whereas the benefit of MRA use was attenuated among patients prescribed 2-drug GDMT (HR=1.05 [95% CI: 0.82-1.34], p=0.7) (Figure 1). Furthermore, MRA use was associated with a 36% reduction in the risk of VTA in patients prescribed 1-drug GDMT (HR=0.64 [95% CI: 0.40-1.01], p = 0.05), whereas among patients prescribed 2-drug GDMT the association of MRA use with VTA risk was also attenuated (HR=1.09 [95% CI: 0.93-1.29], p=0.28) (Figure 2).

Conclusion: In patients with ICD or CRT-D, MRA use is associated with a reduction in mortality and VTA burden in patients who may not be able to tolerate 2-drug GDMT.

Keywords: Cardiac resynchronization therapy; Implantable cardioverter-defibrillator; Heart failure; Mortality; Ventricular tachycardia arrhythmia; Guideline-directed medical therapy

Figure 1: Effect of MRA on mortality in patients prescribed 1-drug vs. 2-drug GDMT

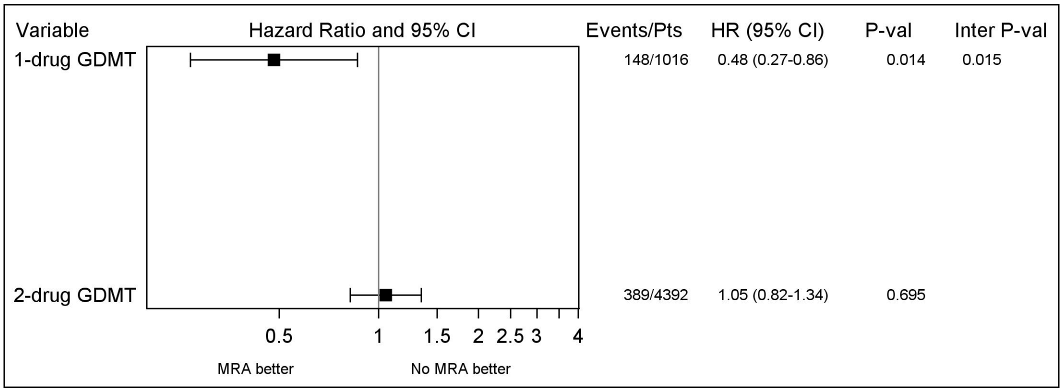
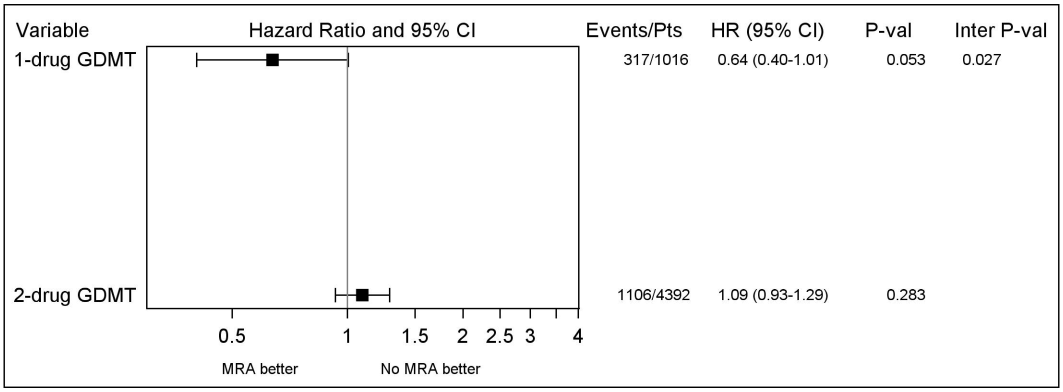


Figure 2: Effect of MRA on VTA in patients prescribed 1-drug vs 2-drug GDMT



Session Title

Defining value for surgeons: learning from the intersections of economic and patient-centered approaches

Authors

Mariah Erlick BA, Derek Wakeman MD, Peter Prieto MD MPH, Larissa Temple MD

Objectives

While the interplay of value-based care and patient-centered care is not a new concept, little has been specific to the field of surgical value. We aim to survey and critically evaluate literature pertaining to surgical value, developing a conceptual model for assessing and improving value.

Methods

We completed a narrative review of published theory and studies that explore models of surgical value. We used snowballing survey methods to thoroughly explore relevant theories, models, and tools. A total of 1602 papers were identified, 126 were abstracted, and 60 were included in this exploration and development of a model of surgical value. By analyzing and stratifying various models and tools to evaluate patient perspectives in value, three different categories were identified: economic, patient-centered, and value-based. These domains were then integrated into a progression of conceptual models centering patient considerations in surgical value.

Results

We identified three domains to be considered. The first, economic, comprises ideas of stakeholder identification, value improvability, intrinsic value, and opportunity cost. The second, patient-centered, identifies patient-reported or patient-important outcome and cost considerations; these are consistently correlated with clinical safety and efficacy. The third, value-based, posits that value is simply defined as outcomes divided by costs, and can include both economic and patient-centered considerations. We found no tool that integrates all domains of patient-centered care and addresses both costs and outcomes to define an expansive yet inclusive definition of surgical value.

Discussion

We identified the need for and subsequently developed a progression of conceptual models of surgical value. Patients are vital stakeholders in the measurement and improvement of surgical value, and models must center the documented breadth of patient outcomes, costs, and experiences.

Funding Information

NRSA Training Core Grant #TL1TR002000

Keratinocyte Media Differences Uncovered During COVID-19 Supply Shortages

Eleanor M. Pope[1], Mary C. Moran[1,2], Matthew G. Brewer[1], Lisa A. Beck[1]*
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*Mentor

Keratinocyte (KC) culture medias are used interchangeably with the expectation of comparable results. The COVID-19 pandemic resulted in supply chain shortages necessitating substitutions to standard protocols. We screened available medias on the KC cell line N/TERT2G and found biological responses varied considerably across three culture medias: KSFM (Gibco, #17005042), KGM2 (PromoCell, #C-20211), and Defined (Gibco, #10744019).

We observed qualitative and quantitative differences in proliferation among KC grown in the different medias; KC cultured in Defined had a significantly lower proliferative capacity. KC differentiation was assessed by Western blot for claudin-1 (CLDN1), occludin (OCLN), cytokeratin-10 (CK10), and loricrin (LOR). CLDN1, OCLN, and CK10 were below the limit of detection in undifferentiated KC cultured in KSFM whereas KC cultured in KGM2 and Defined showed robust expression. Even after differentiation in the same media, expression of CLDN1, OCLN, and LOR was detected earlier and at higher levels in KC cultured in KGM2 and Defined compared to KSFM. KC cultured in KGM2 and Defined developed significantly higher transepithelial electrical resistance (TEER) than cells cultured in KSFM. When treated with IL-4&13, TEER was initially lower and then significantly increased compared to untreated KC cultured in KSFM. TEER significantly decreased in KGM2, and no changes were observed in Defined. Lastly, we observed similar kinetics in susceptibility to infection with vaccinia virus over the course of differentiation; undifferentiated KC showed resistance to infection across all medias.

In summary, the use of different culture medias impacts biological responses (i.e., proliferation, protein expression, barrier function) of KC in a manner that persists even through differentiation in the same media. Our results highlight the misconception that these medias can be used interchangeably for propagating KC *in vitro* and emphasize the importance of providing methodologic details in epidermal biology publications.

Poster Title: Building a Better CAR—Improving CAR-T Cell Trafficking in Cancer Therapy

Kevin Vo, with mentor Dr. Minsoo Kim

URMC Immunology Department

Kim Lab Group Members: Dr. Kihong Lim, Dr. Yeonsun Hong, Dr. Raj Mongre, Dr. Ma Rie Kim, Cooper Sailer, Allison Ryan, Ankit Dahal

CAR-T cells are used as a next-generation therapy for leukemia, but have had limited effect in solid tumors due to poor tumor-killing and lethal toxicity. Patient cases have demonstrated that a significant proportion of infused CAR-T cells erroneously travel to the pulmonary circulation instead of the tumor site, causing toxic effects such as hypotensive shock and multi-organ failure.

In this work, we identify a cytoskeletal protein, BII-spectrin, that is downregulated in CAR-T/in-vitro activated T-cells relative to naive T-cells. BII-spectrin decreases LFA1-ICAM1 interactions between CAR-T's and endothelial cells, requiring CAR-T's to receive chemokine stimulation before they extravasate into tissues. Our experiments show that activated T-cells show loss of chemokine-dependent migration in vitro relative to naïve T-cells, and activated T-cells modified to increase BII-spectrin show restoration of chemokine dependent migration *in vitro*.

Furthermore, in a mouse melanoma model, such modified T-cells show improved host survival and decreased tumor burden relative to standard activated T-cells. Lastly, human patients with high endogenous BII-spectrin levels have better clinical responses to CAR-T than low-BII-spectrin patients, based on clinical neurotoxicity and cytokine release syndrome scores.

Future work involves improving the tumor-infiltration of activated CAR-T cells at the tumor site. Lentiviral transfection will be used to generate anti-CD19 CAR-T cells from healthy donor T-cells. Concurrently, a CD19-expressing lymphoma cell line, BL41, will be cultured to produce tumor spheroids. The anti-CD19 cells will then be cocultured with the BL41 cells for 24-48 h, after which the spheroids will be removed from the growth medium. Finally, next-generation RNA sequencing will be used to identify differentially expressed genes between the successfully tumor-infiltrating cells and the unsuccessful infiltrators.

Resilience in action: Pandemic Narratives of LGBTQ+ Older Adults
Mentors: Dr. Brown Clark, Dr. Brislen
Location: New Mexico
Name: Allison Ogawa

Key-words: LGBTQ+ health, community-based research, resilience

Historical and modern discrimination have contributed to present day health disparities for LGBTQ+ older adults. Resulting differences in family, community, health and wealth along with intersections between race, class and disability often place LGBTQ+ older adults in vulnerable positions easily exacerbated by the Covid-19 Pandemic. Despite this concern, little elaboration is available of this population's lived experience and wellbeing during this time. Further investigation is needed to explore how LGBTQ+ older adults' life narratives were both shaped by and formative of their experience during the pandemic.

To address this, researchers took a qualitative approach grounded in narrative medicine and ethnographic practices to explore the relationship between life narrative and Covid-19 experiences of LGBTQ+ older adults (60+) in New Mexico with special focus on themes of community, health, aging, end of life, grief and resilience. Researchers conducted 30 in-depth, semi structured interviews with key informants in addition to data collection through participant observation. Data analysis employed an integrated approach using start list practices alongside inductive and narrative methods.

Preliminary results reveal that for most LGBTQ+ older adults interviewed, isolation from friends and family, pandemic-related illness/grief, and planning for death and dying were already familiar aspects of daily life before the Covid-19 pandemic. Most participants had built considerable grit and resilience through survival of historical, familial, medical, and social griefs that functioned as potential protective factors. Furthermore, discussion of grief often revealed valuable reflections on values and insight into end of life.

In summary, exploration of life narratives of LGBTQ+ older adults may allow for a greater understanding of each person's resilience and ability to adapt during disrupted social times, supporting the use of strengths-based public health models and resiliency-based grief models while highlighting the importance of storytelling in medicine.

Mentor: Susan Daiss, MA, M. Div
University of Rochester School of Medicine & Dentistry
Department of Medical Humanities

Poster Title: "At Capacity"; 30 Fictional Short Stories on Being a Multi-Minority Medical Student

Location: URSMD

Researcher: Davy Ran, MSc MPH

Background: Minoritized student recruitment and retention is of great relevance to medicine right now as our understanding of healthcare shifts to a greater awareness of the positive impact of workforce diversity on patient health outcomes across the board, especially with regards to the provision of culturally competent, specialized, and compassionate care (Rivero 2015, AAMC 2016).

One highly impactful method for minority recruitment and retention is student narratives. Narrative works are more relatable and compelling than a simple statement of facts and in some ways authors may act as advisors and mentors for those reading their works. More diverse narratives can help recruit a more diverse workforce; national yearly research by the Federal Communications Commission's Minority Ownership Task Force has shown that representation in media has a huge impact both on how people see minorities and what minorities believe they are capable of. A lack of representation or the presence of exclusively poor representation created with a lack of input by the communities they represent can greatly damage efforts to improve social equity, whereas positive representation has been shown to not only serve a source of empowerment to those they represent but also a source of education for those outside the community.

Currently, the vast majority of minority narratives in medicine focus on the trauma minority patients have experienced at the hands of unqualified doctors; some particularly striking titles included "Why Latinos Dread Going to the Doctor" and "For People with Disabilities, Doctors Are Not Always Healers". As a queer, disabled Cuban-American I represent several minorities in medicine. Latinxs represent 18% of the total population in the USA but only 6.3% of all accepted medical students. (AAMC 2016, Noe-Bustamante 2020). People with disabilities represent at least 20% of the overall population but a mere 0.2% of medical students (American Medical News 2005). There are no established statistics when it comes to LGBT students but an updated estimate is around 4% (Rivero 2015). In concordance with the low rates of openly-identified queer, disabled, and Latinx students there are few narratives written by people with any of those identities, much less by someone who identifies as all three.

In essence, there are currently not enough creative/personal narratives written by and about minorities in medicine. Narrative medicine accounts written by minority writers with the input of other minoritized medical students can serve as a powerful resource for education, support, and inspiration for those interested in or going into the medical field, ultimately contributing to greater diversity and inclusion in the medical field which will, over time, translate into better patient care.

Methods: Over the course of 4 years, multiple minority medical students were interviewed about their most impactful experiences in medical school. Notes were taken on a password-protected device wherein all identifying data was removed including names, locations, dates, and other revealing information. Combining their insights with my own personal experiences, I utilized the qualitative method of conventional content analysis to identify commonalities. This produced a set of overarching themes and associated sub-topics which were then used as inspiration for every short story included in the final collection.

Result: A compilation of 30 fictional short stories based on real life experiences of minority medical students over the last 4-8 years based on the following overarching themes:

1) The experience of transitioning from ‘civilian’ to medical student
2) Disability
3) Race
4) Sexual orientation/Gender identity

Major sub-topics include: confronting human mortality, working through COVID-19, dissecting donor bodies, managing imposter syndrome, and more.

Several stories in the final collection have additionally been published independently including:

“Death and Diet Pepsi”
1st place winner of the 2022 FMEC Creative Writing Competition. Piece presented at FMEC Annual Meeting and published in the FMEC 2022 Awards Booklet.

“Dr. Good Girl”
Please See Me Online Literary Journal. 2022;10. Accessible at:
https://pleaseseeme.com/issue-10-womens-health/nonfiction/dr-good-girl-davy-ran/

“The Motherhouse”
2nd place winner of the 2021 Hope Babette Tang Humanism in Healthcare Essay Contest. Acad Med. 2021;96:1558–1559.

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Pak, Clara
Preceptor
John Kempen MD, PhD
MyungSung Christian Medical Center (MCM) Eye Unit
MCM Comprehensive Subspecialized Hospital and MyungSung Medical College, Addis Ababa, Ethiopia.

Research was completed in Addis Ababa, Ethiopia.

Impact of Refresher Training on Outcomes of Trachomatous Trichiasis Surgery

Background

Trachomatous trichiasis (TT) is a severe consequence of chronic inflammation and conjunctival scarring resulting from trachoma, the leading infectious cause of blindness worldwide. Our prospective cohort study evaluated the effectiveness of refresher training (RT) on the outcomes of upper lid (UL) TT surgery in rural Ethiopia.

Methods

A total of 261 eyes contributed by 173 patients were studied between 2017-2019. Patients undergoing UL TT surgery in at least one eye by one of the participating surgeons were included. Patients were split into two cohorts: patients enrolled prior to (C1) and after (C2) RT (one week refresher training with practice on a Head Start mannequin and supportive supervision in live surgery by expert trainers). Data were collected at preoperative enrollment, and at 6- and 12-month follow-up visits. The main outcome of interest was development of post-operation TT (PTT). A series of multivariate generalized estimating equations (GEEs) were fit to model PTT involving potential covariates of interest.

Results

By one year postoperatively, 37/128 eyes (28.9%) in C1 and 22/133 eyes (16.5%) in C2 developed PTT (p=0.03). Other than surgeon RT participation, no factors studied were associated with differences in PTT.

Conclusion

Our results indicate a significant reduction in the odds of PTT after surgeon participation in RT as compared to eyes receiving surgery before RT. This observation suggests a significant potential benefit of the refresher training with Head Start mannequin practice and supportive supervision during surgery, suggesting RT may be a valuable strategy to improve surgical outcomes.

Mentors: Franklin Huang, MD, PhD (UCSF), David Korones, MD (URMC)
Poster Title: Cancer Demographics and Time to Treatment in Belize
Research location: University of Rochester Medical Center, Karl Heusner Memorial Hospital
Name: Wayne Wong

BACKGROUND: Belize is a middle-income Caribbean country with poorly described cancer epidemiology and no comprehensive cancer care capacity. In 2018, GO, Inc. partnered with the Ministry of Health and the national hospital in Belize City to create the first public oncology clinic in the country. Here, we report demographics from the clinic and describe time intervals to care milestones to allow for public health targeting of gaps.

PATIENTS AND METHODS: Using paper charts and a mobile health platform, we performed a retrospective chart review at the Karl Heusner Memorial Hospital (KHMH) clinic from 2018 - 2022.

RESULTS: We found expected histologic distributions (n=465) with breast (28%) and cervical (12%) being the most common. Most patients (70%) presented with stage 3 or 4 disease. Most patients were without insurance (78%) and unemployed (79%). Only 21% of patients ever started curative intent treatment. Median time from patient-reported symptoms to a biopsy or treatment was 130 and 189 days. For the most common histology, breast, similar times were seen at 140 and 178 days. Time intervals at the clinic: < 30 days from initial visit to biopsy (if not previously performed) and < 30 days to starting chemotherapy.

CONCLUSION: This study reports the first hospital-based cancer statistics for Belize. Many patients have months between symptom onset and treatment. In this setting, the clinic has built infrastructure allowing for minimal delays in care despite an underserved population. This further affirms the need for infrastructure investment and early detection programs to improve outcomes in Belize.

Title: Inpatient Utilization, Costs, and Disparities for Adolescent and Young Adults with Complex Chronic Conditions in the Last Year of Life

Authors: Spenser Y. Chen, BS [1], Lisa Chamberlain, MD, MPH [2], Olga Saynina, MBA [2], Emily E. Johnston, MD, MS [3]

[1.] *University of Rochester School of Medicine & Dentistry*

[2.] *Stanford University School of Medicine*

[3.] *University of Alabama at Birmingham Marnix E. Heersink School of Medicine*

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Background: Adolescents and young adults (AYA) with complex chronic conditions (CCC) transition from pediatric to adult oriented healthcare while receiving ongoing care for chronic conditions. This process of care transition is complex with significant challenges for patients and families. Little is known about the end-of-life care pattern and sociodemographic disparities in utilization for AYA with CCCs, which is critical for resource planning and end-of-life care equity.

Methods: We conducted a population-based retrospective analysis using the California Office of Statewide Health Planning and Development private inpatient discharge database to examine the last year of life for AYA (15-30y) with CCCs. We included AYA with the same CCC diagnosis at ≥ 2 visits in the last 6 months who died from a disease-related cause between 2005 and 2018. Inpatient days, costs (2018 US dollars), number of admissions, and number of admissions with ICU-level care (identified via ICD-9/ICD-10 codes for ICU-related procedures such as intubation) in the last year of life were determined. We examined the association between sociodemographic/clinical factors and being in the top 5% of utilizers for 1) inpatient days, 2) inpatient costs, and 3) number of admissions using multivariable regression analysis.

Results: The 9,723 AYA died at a mean age of 24y (SD=4). The majority were male (60%) and publicly insured (64%) (Table 1). The largest racial/ethnic group was Hispanic (39%), followed by non-Hispanic white (35%), and black (13%). The most common CCC categories were neuromuscular (40%), cardiovascular (38%), and malignancy (33%); 34% had ≥ 3 CCCs. They spent a mean of 41.6 days (SD=54.1) in the hospital over a mean of 3.6 admissions (SD=3.6) with a mean of 1.0 admissions with ICU-level care (SD=0.9) in the last year of life. Mean inpatient costs were $214,423 (SD=$305,003). Inpatient costs and length of stay slowly increased over the first six months and then steeply increased in the last month before death. (Figure 1). Private insurance and dying at an adult hospital with pediatric services were associated with lower risk of being a high utilizer for inpatient days (aOR=0.66 [95% CI: 0.50-0.86]; reference, public insurance, aOR= 0.76 [95% CI: 0.62-0.94]; reference, adult hospital, respectively). Being Black was associated with high inpatient days and admission utilization (aOR=1.60 [95% CI: 1.16-2.20], aOR=2.06 [95% CI: 1.48-2.87]; reference, non-Hispanic white, respectively). Being Asian and median household income ≥4 times the federal poverty level was associated with being a high cost utilizer (aOR=2.14 [95% CI: 1.44-3.20]; reference, non-Hispanic white, aOR = 1.56 [95% CI: 1.04-2.33]; reference, <2 times the federal poverty level).

Conclusion: AYA with CCCs in California exhibited high inpatient costs and utilization in the last year of life, especially as they approached death, with significant sociodemographic variation. It is critical to determine if this variation represents patient preferences, provider biases, or systemic factors such as resource availability.

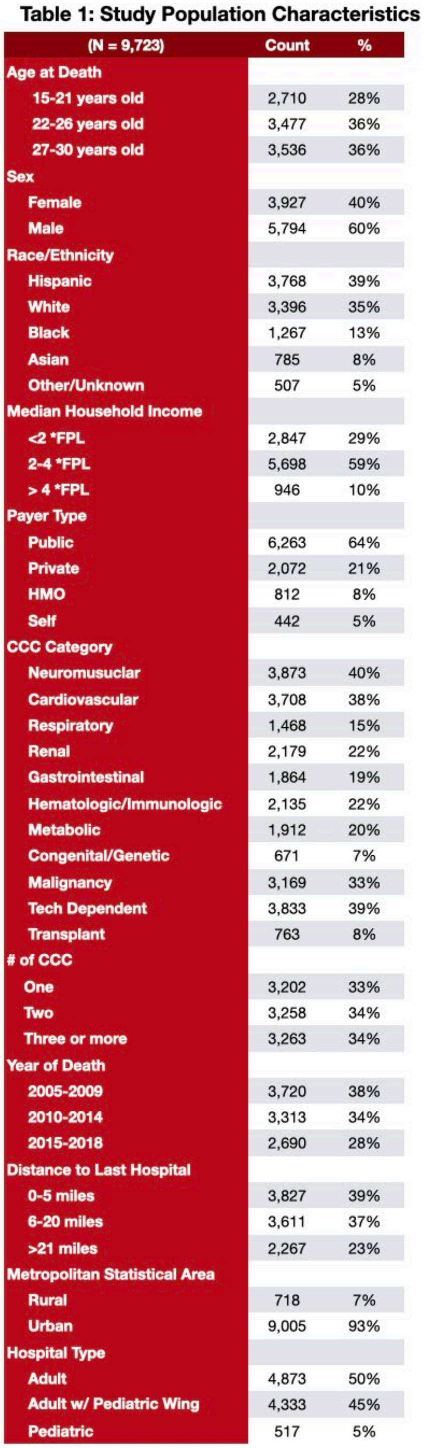
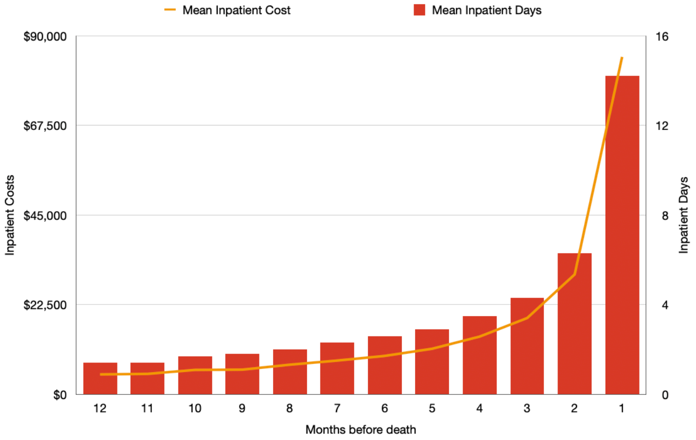


Table 1: Study Population Characteristics

(N = 9,723)	Count	%
Age at Death		
15-21 years old	2,710	28%
22-26 years old	3,477	36%
27-30 years old	3,536	36%
Sex		
Female	3,927	40%
Male	5,794	60%
Race/Ethnicity		
Hispanic	3,768	39%
White	3,396	35%
Black	1,267	13%
Asian	785	8%
Other/Unknown	507	5%
Median Household Income		
<2 *FPL	2,847	29%
2-4 *FPL	5,698	59%
> 4 *FPL	946	10%
Payer Type		
Public	6,263	64%
Private	2,072	21%
HMO	812	8%
Self	442	5%
CCC Category		
Neuromusuclar	3,873	40%
Cardiovascular	3,708	38%
Respiratory	1,468	15%
Renal	2,179	22%
Gastrointestinal	1,864	19%
Hematologic/Immunologic	2,135	22%
Metabolic	1,912	20%
Congenital/Genetic	671	7%
Malignancy	3,169	33%
Tech Dependent	3,833	39%
Transplant	763	8%
# of CCC		
One	3,202	33%
Two	3,258	34%
Three or more	3,263	34%
Year of Death		
2005-2009	3,720	38%
2010-2014	3,313	34%
2015-2018	2,690	28%
Distance to Last Hospital		
0-5 miles	3,827	39%
6-20 miles	3,611	37%
>21 miles	2,267	23%
Metropolitan Statistical Area		
Rural	718	7%
Urban	9,005	93%
Hospital Type		
Adult	4,873	50%
Adult w/ Pediatric Wing	4,333	45%
Pediatric	517	5%

Figure 1: Mean Inpatient Costs and Days in the Last Year of Life by Month



Title: Does Socioeconomic Disadvantage Impact Long-term Renal Transplant Outcomes Despite Excellent Perioperative Results?

Authors: Rafael Cisneros, BS; Luis I. Ruffolo, MD; Benjamin S. Dale, BS; John Martens, MPH; Mariana Chavez-Villa, MD; Amit Nair, MD; Jeremy Taylor MD; Roberto Hernandez Alejandro MD; Randeep Kashyap, MD; Karen Pineda-Solis, MD.

Introduction:

The impact of the social determinants of health (SDH) on post-transplant outcomes remains understudied. Poor outcomes are associated with underprivileged status. The Social Deprivation Index (SDI) is a recent metric created to quantify disadvantage in a neighborhood and is comprised of seven demographic characteristics including education, poverty level, and non-employment. Our aim is to explore whether more disadvantaged neighborhoods (high SDI) are associated with poor long-term renal transplant (RT) outcomes.

Methods:

Between 2014 – 2020, a retrospective review of all deceased-donor RT was performed. We evaluated pre-operative organ donor and recipient characteristics, and long-term postoperative outcomes. Our population's SDI median was used to define high versus low SDI cohorts. We performed a comparative analysis between both groups. Univariate statistics were used for the analysis.

Results:

286 deceased-donor RT were performed. We excluded 70 patients who either did not report a geocoded address or were preemptive. African Americans comprised a majority of the high-SDI group (56.9%) compared to the low-SDI group (15.9%). The kidney donor profile index (KDPI), complications, LOS, and creatinine values at discharge were similar in both groups. However, creatinine at 6, 12, and 18 months were significantly higher in the high-SDI cohort (table 1).

Conclusion:

Our analysis showed that patients from more disadvantaged neighborhoods receive equal RT compared to patients from more affluent neighborhoods. However, despite similar postoperative courses, patients from disadvantaged neighborhoods experienced statistically significant higher elevation of creatinine in the follow-up period. Future work must elucidate the drivers of worsening graft function in vulnerable populations.

Highlighted = included in the ten-row maximum for ACS abstract

	SDI - Low n=107	**SDI - High n=109**	**p value**
Recipient Characteristics			
Social Deprivation Index (SDI), median (IQR)	32 (13-45)	84 (74-94)	-
Age, mean ± SD (years)	53.5 ± 13.4	50.3 ± 12.2	0.072
BMI, median (IQR)	27.3 (24-31.9)	30.2(24.5-35)	0.07
Sex, n (%)			
Female	40 (37.4)	50 (45.9)	0.206
Male	67 (62.6)	59 (54.1)	
Race			
African American	17 (15.9)	62 (56.9)	< 0.001
Asian	5 (4.7)	5 (4.6)	
Caucasian	81 (75.7)	31 (28.4)	
Latin	2 (1.9)	11 (10.1)	
Native American	1 (0.9)	0 (0)	
Other	1 (0.9)	0 (0)	
Dialysis type			
Hemodialysis	85 (79.4)	93 (85.3)	0.256
Peritoneal	22 (20.6)	16 (14.7)	
EPTS score, median (IQR)	60 (27-83)	37 (21-72)	0.018
History of Diabetes Mellitus (DM)	33 (30.8)	33 (30.3)	0.928
History of Hypertension (HTN)	98 (91.6)	101 (92.7)	0.77
Candidate choice: Exclude KDPI > 85	21 (19.6)	29 (26.6)	0.224
Candidate choice: Exclude ECD Organs	8 (7.5)	20 (18.3)	0.017
Days on Dialysis before Transplant , median (IQR)	1962 (1106-2780)	2227 (1289-2905)	0.297
Days on Waitlist, median (IQR)	959 (414-1875)	1109 (210-1964)	0.9145
Donor Characteristics			
Donor Age mean ± SD (years)	40.3 ± 15.6	39.9 ± 14.6	0.86
Donor BMI, median (IQR)	29.4(24.7-33.3)	27.5 (22.9-32.7)	0.191
KDPI, median (IQR)	43 (17-65)	43 (20-64)	0.67
Donation After Cardiac Death (DCD)	31 (29)	36 (33)	0.519

Donor History of DM	10 (9.3)	10 (9.2)	0.961
Donor History of HTN	41 (38.3)	29 (26.9)	0.073
Donor Hepatitis C Virus +	3 (2.8)	4 (3.7)	1
HLA mismatch	87 (81.3)	92 (86)	0.355
Gender Mismatch	46 (43)	44 (40.4)	0.696
Ischemic time (min), median (IQR)	731 (532-1046)	706 (552-1024)	0.616
Induction			
Basiliximab	38 (35.5)	22 (20.2)	0.012
Thymoglobulin	69 (64.5)	87 (79.8)	
Labs (median, mg/dL)			
GFR at Discharge	36 (19-52)	33.5 (17-49.5)	0.633
Creatinine at Discharge (mg/dL)	1.98 (1.38 - 3.49)	2.22 (1.51 - 3.53)	0.397
Creatinine at 6 months (mg/dL)	1.27 (1.0 - 1.55)	1.37 (1.2 - 1.82)	0.016
Creatinine at 12 months (mg/dL)	1.29 (1.02 - 1.66)	1.38 (1.17 - 1.84)	0.018
Creatinine at 18 months (mg/dL)	1.25 (1.0 - 1.63)	1.33 (1.16 - 1.76)	0.044
Outcomes			
Needed ICU (days)	43 (40.2)	30 (27.8)	0.055
Length of Stay, median (days, IQR)	7 (5-12)	7 (5-10)	0.392
Clavien-Dindo Classification complication			
No Complication	26 (24.5)	39 (35.8)	0.073
Grade I	14 (13.2)	6 (5.5)	
Grade II	24 (22.6)	24 (22)	
Grade III	22 (20.8)	27 (24.8)	
Grade IV	19 (17.9)	10 (9.2)	
Grade V	1 (0.9)	3 (2.8)	
Delayed graft function	28 (26.2)	23 (21.1)	0.381
Index mortality	2 (1.9)	3 (2.8)	1
Graft Failure	6 (5.6)	9 (8.3)	0.444
Mortality	18 (16.8)	11 (10.1)	0.147

Table 1. This table stratifies transplant recipient and donor characteristics, laboratory values as well as peri- and long-term post-operative outcomes by the Social Deprivation Index (SDI). Our population's SDI median was used to define high versus low SDI cohorts (median, standard deviation, unless otherwise stated).

Informed Kidney Therapy Decision Making for Patients with End-Stage Kidney Disease Receiving Maintenance Dialysis: What do patients say?

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Background:

Informed decision making has both legal and ethical implications for kidney therapy (KT) decision-making process. However, previous small scale studies suggest significant lapses in informed decision making for people receiving dialysis. To advance the field, we undertook the current study examining patient's recall of various aspects of informed decision making during KT decisions.

Methods:

We surveyed hospitalized patients receiving maintenance dialysis at an academic tertiary care hospital in upstate New York. We assessed Informed KT decision making using a previously published informed KT decision making questionnaire[1]. We present descriptive analyses of our findings.

Results:

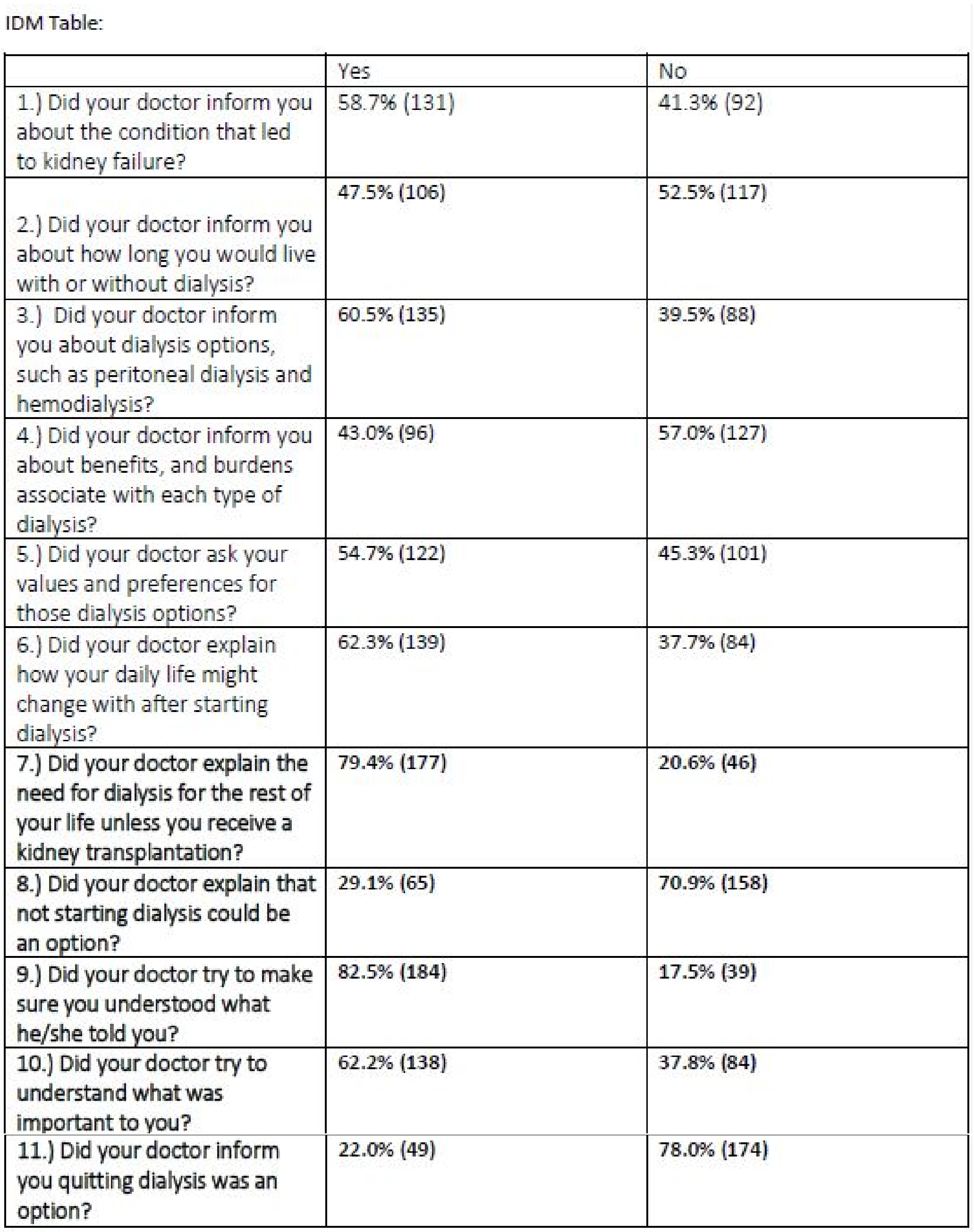
The mean age of the respondents (n=223, 59% response rate) was 68 years (SD ±15.4), 50% had attained a high school level education or lower, 39% were Black, 24% White non-Hispanic, and 21% of Hispanic or Latino origin. Patients had been receiving dialysis treatment for an average of 3.1 years
(SD±2.4). Patient's responses regarding informed decision making are grouped into three categories: (1) disease and kidney therapy (KT) options knowledge (2) KT decision making, and (3) prognosis.

In response to questions about disease and KT options knowledge, 41% of patients responded "No" to whether they had been informed about the condition that led to kidney failure, 40% were not informed of both dialysis option, and 57% were not aware of the potential benefits and burdens of each option. Regarding KT decision making, nearly 71% reported that conservative kidney management was never presented as an option, and 78% did not recall being informed of the option to withdraw from dialysis. In response to questions about prognostic awareness, 53% did not report being informed about life expectancy with and without dialysis, and 38% did not recall an explanation for how their daily life might change after initiating dialysis.

Conclusion

An assessment of informed decision making among hospitalized patients receiving maintenance dialysis revealed significant lapses in the informed decision making process. Interventions to improve informed decision making in people with CKD are urgently needed.

1: Song MK, Lin FC, Gilet CA, Arnold RM, Bridgman JC, Ward SE. Patient perspectives on informed decision-making surrounding dialysis initiation. *Nephrology Dialysis Transplantation.* 2013;28(11):2815-2823. doi:10.1093/ndt/gft238



IDM Table:

	Yes	No
1.) Did your doctor inform you about the condition that led to kidney failure?	58.7% (131)	41.3% (92)
2.) Did your doctor inform you about how long you would live with or without dialysis?	47.5% (106)	52.5% (117)
3.) Did your doctor inform you about dialysis options, such as peritoneal dialysis and hemodialysis?	60.5% (135)	39.5% (88)
4.) Did your doctor inform you about benefits, and burdens associate with each type of dialysis?	43.0% (96)	57.0% (127)
5.) Did your doctor ask your values and preferences for those dialysis options?	54.7% (122)	45.3% (101)
6.) Did your doctor explain how your daily life might change with after starting dialysis?	62.3% (139)	37.7% (84)
7.) Did your doctor explain the need for dialysis for the rest of your life unless you receive a kidney transplantation?	**79.4% (177)**	**20.6% (46)**
8.) Did your doctor explain that not starting dialysis could be an option?	**29.1% (65)**	**70.9% (158)**
9.) Did your doctor try to make sure you understood what he/she told you?	**82.5% (184)**	**17.5% (39)**
10.) Did your doctor try to understand what was important to you?	**62.2% (138)**	**37.8% (84)**
11.) Did your doctor inform you quitting dialysis was an option?	**22.0% (49)**	**78.0% (174)**

Parmeter, Stephanie

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Maternal exposure to adverse childhood experiences as a predictor of breastmilk immune content

The Adverse Childhood Experience (ACE) Study conducted by the Kaiser Permanente Institute and the Centers for Disease Control and Prevention in 1998 was among the first to describe a significant correlation between childhood stress exposure and adverse health outcomes in adulthood. This has important clinical and public health implications as a nearly half of individuals in the United States report experience of at least one ACE and many of the consequent health risk behaviors and diseases underlie the leading causes of death in adulthood. Subsequent studies have sought to better understand the nature of this relationship, with significant findings including alterations in cortisol regulation by the hypothalamic adrenal axis and immunologic function.

A recent novel hypothesis has emerged concerning possible intergenerational transmission of these biological consequences of exposure to childhood trauma such that they not only directly impact the individual, but may also be passed to her children. The Developmental Origins of Health and Disease (DOHaD) model describes a mechanism by which the prenatal environment in utero programs adaptive biological responses in fetal development which may persist throughout life. In this study, we sought to expand upon the idea that child exposure to altered maternal biology affects development. We focused on breastmilk as a potential source of continued exposure of the infant to maternal biology postnatally. We aimed to explore the hypothesis that maternal exposure to ACEs leads to a shift towards a more pro-inflammatory cytokine profile in breastmilk, thus exposing the infant to this milieu as their immune system continues to develop in the early life period.

This study was conducted as part of the National Institute of Health's Environmental Influences on Child Health Outcomes (NIH ECHO) program. The Rochester cohort consists of 326 mother-child dyads that have been followed longitudinally for several years. For this study, we utilized a total of 287 samples of breastmilk collected at the 1- and 6-month time points. The samples were thawed, aliquoted, and cleared using serial centrifugation and separation techniques. The final cleared samples were then processed using Luminex multiplex analysis for a selection of 16 bioactive cytokines. We included positive and negative controls as well as serial dilutions to assure for intra- and inter-plate reliability. We also compiled relevant questionnaire data including maternal sociodemographic information and history of childhood stress exposure.

We are currently working with statisticians to analyze the data for significant levels of analyte detection and relative abundance, stability of cytokine levels across time points, and correlation of cytokine profiles with demographic data, covariates, and maternal early life stress exposure metrics such as ACEs. A parallel analysis of these factors using maternal serum samples is also underway and early results suggest a number of significant associations between serum cytokines and ACEs. Should similar patterns emerge from the breastmilk data, this would provide support for the proposal that breastmilk represents a significant source of postnatal exposure of the infant to the biologic consequences of maternal ACEs and represents a potential mechanism of intergenerational risk transmission. Future areas of study will include collection of child health outcome data within the cohort to determine whether there is any association between maternal immunologic profiles and child health outcomes, such as development of immune-mediated conditions like allergies.

External Research

Title: Considerations for Transplant Psychiatry Evaluation: Peripartum Cardiomyopathy

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Background:

The diagnosis of peripartum cardiomyopathy (PPCM) is often delayed in young women, whose symptoms are initially attributed to pregnancy (Davis et al., 2020). This delay in diagnosis can result in distrust in healthcare providers and psychological distress, consequently translating to poor health behavior. For patients with PPCM in need of advanced cardiac therapies, such as left ventricular assist device (LVAD) or heart transplant, this psychological consequence of delayed diagnosis must be taken into consideration during their psychiatric evaluation. In this poster, we present a case of a patient who received a delayed diagnosis of PPCM and developed a trauma response, resulting in avoidance of care. We highlight the importance of a nuanced psychiatry evaluation on their health outcome.

Case Description:

Patient is a 35-year-old female with a history of PPCM status-post LVAD implantation, major depressive disorder, and panic disorder, who presented with worsening heart failure requiring urgent transplant evaluation. Outpatient LVAD coordinators expressed significant concern due to the patient's history of inconsistent compliance with required laboratory tests (ex: INR monitoring). During Transplant Psychiatry assessment, it became apparent that the patient's lack of adherence was not secondary to disregard of medical advice, but more consistent with avoidance secondary to PTSD symptoms associated with her local hospital that missed a timely diagnosis of PPCM. Transplant Psychiatry recommended that the patient participate in trauma-focused psychotherapy to address her avoidance behaviors and improve her coping mechanisms to increase chance of successful transplant. After transplant, the patient has had a notable improvement in treatment adherence and continues to do well both psychiatrically and medically, with no evidence of rejection.

Discussion:

PPCM often requires urgent admission, extensive workup, and carries a significant risk of mortality (Davis, 2020). Unfortunately, nearly 40% of women with PPCM experience symptom dismissal by health care providers, while up to 25% of women are initially given inaccurate diagnoses (Dekker, 2016). Delay in diagnosis may result in a heightened sense of vulnerability as patients are more likely to experience negative medical outcomes and preventable complications (Fett, 2013). Consequent distrust in healthcare systems is associated with increasing depression, reduced coping skills, and disengagement from care (Gupta, 2013). This is significant in transplant psychiatry, as eligibility for advanced treatment is often dependent on the patient's ability to be reliable for extensive follow-up care. Transplant-psychiatrists should be familiar with the psychological challenges associated with PPCM to help patients optimize health-promoting behaviors by addressing underlying trauma.

Conclusion:

This case report highlights the need for a nuanced transplant evaluation sensitive to the psychological burden of patients with PPCM and specifically cautions against the misinterpretation of non-adherence as disinterest in care, as maladaptive behavior may be reflective of an underlying trauma-response associated with delay in diagnosis.

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Calcitonin Gene Related Peptide (CGRP) increases murine pain responses, which are attenuated by inhibition of the CGRP receptor: implications for non-opioid therapeutics.

Pain is a major public health problem[1, 2] and there is an urgent need for new non-addictive therapies[3]. Calcitonin gene-related peptide (CGRP) plays a critical role in pain perception, ranging from mechanical, thermal, inflammatory, and migraine pain[4, 5], and is an emerging target for migraine treatment[6-11]. CGRP's effect on pain is thought to be mediated primarily by cAMP signaling, but this has not been definitively tested *in vivo*[12-15]. Our laboratory has previously shown that the CGRP receptor can signal through *multiple* pathways *in vitro*, and signaling bias is controlled by the intracellular protein CGRP-Receptor Component Protein (RCP), which is an allosteric modifier of CGRP receptor signal transduction[16-18]. RCP biases CGRP receptor signaling towards the Gαs pathway *in vitro*, and when RCP is depleted the CGRP receptor signals primarily through the MAPK pathway. Moreover, the laboratory has generated an inducible RCP-null mice, allowing for tissue–specific and developmental specific depletion of RCP.

We crossed RCP-loxP mice with nestin-Cre ER mice to generate a neural loss of RCP when induced with tamoxifen. In preclinical models it can be difficult to assess pain but an evolutionarily-conserved pain response is facial grimacing[19], which includes signs of discomfort such as eye closure, ear orientation, or nose and cheek bulges quantified with the mouse grimace scale (MGS)[20-22]. Our *premise* is that RCP biases signaling toward cAMP and pain signaling *in vivo*, and in the absence of RCP pain will be reduced, and that we will be able to detect these differences with MGS. We induced pain by administering intraperitoneal (i.p.) CGRP (0.1 mg/kg) and assayed MGS at 0, 5, 10, 15, and 30 minutes after injection and compared this response to vehicle injections. We found that mice lacking neuronal CGRP-RCP were less affected by CGRP-inducing pain than their non-induced littermates and WT control mice.

We have found that our previous *in vitro* biochemical findings are recapitulated in vivo models, and will provide much needed new non-opioid therapeutic targets.

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Assessment of Pain in Emergency Department among Deaf American Sign Language Users in Rochester, NY

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Introduction:

The emergency department (ED) is a valuable setting in which to assess healthcare provision and delivery because, unlike in a primary care setting, the unplanned and undifferentiated nature of an ED visit can magnify preexisting inequities and disparities. In this vein, many Deaf individuals view themselves as members of a unique and vibrant culture with its own language (American Sign Language, ASL), belief systems, values, and standards. Deaf ASL users face health disparities through a lack of health information available in ASL, barriers to communication with the clinical care team and limited provider cultural sensitivity – both of which may influence the clinical assessment and treatment and potentially result in health disparities compared to patients who use English as a primary means of communication.

The aim of this study was to expand upon prior work conducted at the University of Rochester to further understand the way in which acute pain is assessed in the ED setting among patients who use ASL or English for communication with their clinical care team.

Methods:

The initial study was conducted by faculty in the Department of Emergency Medicine (see below). The primary study was a retrospective cohort study in which subsamples of index ED visits (i.e., first ED visit) occurring in 2018 among adults aged 18 years or older who identified their primary language as ASL (n=257) and a comparison group comprised of primary English users selected at random (n=429). Both groups were assessed using a structured retrospective review of their electronic health record. Results of that study indicated potential differences in the assessment of acute pain as measured by a visual analog pain scale. The purpose of the present study was to evaluate this finding in further detail through an in-depth review of the medical records. Specifically, the present study aimed to compare between ASL and English users and assess for differences in the following key metrics: 1) missingness of the visual analog pain scale; 2) variation in the reported pain score; 3) differences in how acute pain was documented in the medical record by the clinical care team.

Results:

In this hypothesis generating sub-study, we found a comparable mean pain score between groups (4.25 ASL, 4.46 English). A low pain score (0-2) was slightly less frequent among ASL users, with 88 out of 257 ASL users (34.2%) indicating a low score compared to 169 out of 429 (39.4%) for English speakers. Reporting high pain scores (8-10) was less likely in the ASL group (61, 23.7%) compared to English users (135, 31.4%). A total of 44 patients (6.4%) did not have a recorded pain score, indicating overall excellence and compliance in the measurement of the pain in the ED. However, 25 of the missing group come from the Deaf ASL cohort (19.4%), proportionally much higher than control English speakers, the remaining 19 out of 429 (4.5%).

Our also suggests that, encounters in which no pain score was recorded for English users, an approximate pain level was suggested or implied by the attending physician encounter notes or initial intake notes, regardless of acuity level of the patient encounter. However, no discussion of the gradation or scale of pain was suggested in the majority of ASL user patient charts including moderate-to-high acuity encounters.

Conclusion:

The preliminary results of our study suggest that differences in assessment of pain among ASL users compared to English users presenting to the ED for acute care. These potential healthcare disparities may present an opportunity for further intervention and to improve quality of care..

Note: the original study was conducted by the following faculty members: Kenneth Conner, PsyD, Jason Rotoli, MD, Nancy Wood, MS, Aileen Aldalur, PhD, and Courtney Jones, PhD MPH. Dr. Jones served as the mentor for this medical student sub-study.

Basic Science, Clinical and Translational Research

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Avascular Necrosis and Minimal Trauma Bone Fractures in Patients with Dyskeratosis Congenita

Dyskeratosis congenita (DC) and related telomere biology disorders (TBD) result from germline variants in genes required for telomere maintenance. DC is traditionally characterized by a triad of nail dysplasia, oral leukoplakia, and reticular skin pigmentation. Significant complications include bone marrow failure (BMF), pulmonary fibrosis, liver disease, and hematologic and solid organ malignancies. Previous reports described avascular necrosis (AVN) of the femoral head or humerus in DC/TBD. However, these findings were limited to a few individual case reports. Herein, we present a study of AVN and minimal trauma fractures (MTF) in a large cohort of patients with DC/TBD.

We reviewed medical records of all patients with a confirmed diagnosis of DC/TBD enrolled in the IRB-approved Inherited Bone Marrow Failure Syndromes study (NCT00027274) between 2002 - 2019 for the history of AVN and/or MTF. Data were compiled on DC/TBD characteristics, treatments, as well as body mass index (BMI), lipid profile, bone mineral density (BMD), and 25-hydroxyvitamin D (25[OH]D) levels. We used stratified random sampling to match DC/TBD patients with AVN and/or MTF by age, gender, inheritance pattern and genotype with a control group of DC/TBD patients with no AVN/MTF. Distributional variance was assessed for all t-tests and two-sided p values <0.05 were considered significant. Statistical analysis was carried out using RStudio (Ver 1.4.1106).

Forty-two of 233 patients (18%) with DC/TBDs experienced at least one AVN and/or MTF at a median age of 21.9 years (range 4 to 58.7); 15/42 were females (Table 1). 23 patients had AVN alone, 6 had MTF alone, and 13 developed both AVN and MTF (Figure 1). The median age at first AVN was 24.1 years (range 6.3 - 58.7) and at first MTF 13.6 years (range 4 - 44.3). AVN was more common in patients with autosomal recessive/X-linked recessive (AR/XLR)/TINF2 DC (n=20, 21.3%) and developed at a younger age (median 18.8 years, range 6.3 - 47.8) than in patients with autosomal dominant (AD) disease (12.5%; median age 29.9 years, range 11.1 - 58.7); p=0.013. MTF occurred almost exclusively in patients with AR/XLR/TINF2 DC (n=17, 19%) compared with AD DC/TBD (n=1, .9%); p<.0001.

There were 68 AVN events in 36 patients (median 2 events/patient, range 1 - 5). The most frequent sites were femoral heads (33/36) followed by humeral heads (5/36) and knees (3/36); 22/33 had bilateral femoral head AVN (Figure 1). Twenty-two of 26 patients with severe BMF received androgen/steroids within 5 years of AVN and 8 received hematopoietic cell transplantation (HCT). Compared with the matched control group, significantly more DC patients with AVN had severe BMF and received androgen/corticosteroids (p<0.02). Importantly, 12/36 DC/TBD patients (33%) developed AVN without prior HCT, corticosteroid, or androgen treatment. 24/36 patients received treatment for AVN, including total hip arthroplasty (n=15) and core decompression (n=5) or other medical intervention (n=4). Median time from diagnosis with AVN to treatment was 0.81 years (range 0.03 - 2.7).

We identified 38 MTF events in 19 DC patients; the most frequent fracture site was the femoral diaphysis (11 events in 8 patients) (Figure 1). Fractures occurred spontaneously or during routine activities such as entering a vehicle, running in the playground, or low-impact dancing as per patient reports. 17 patients (89%) with MTF had severe BMF, 12 (63%) had received HCT (7 had taken androgens/steroids). Compared with matched controls, significantly more DC patients with MTF had received HCT (p=0.02).

Other factors such as BMD, elevated cholesterol, overweight/obesity, and 25[OH]D levels were not significantly associated with AVN or MTF in our cohort.

AVN and MTF are highly prevalent in patients with DC/TBDs. AVN developed across the entire DC/TBD spectrum but was significantly associated with severe BMF and AR/XLR/TINF2 DC. MTFs occurred almost exclusively in young patients with severe disease indicated by AR/XLR/TINF2 mode of inheritance. Improved screening and effective clinical management of symptoms for patients at higher risk of developing AVN/MTF is needed. Furthermore, these findings signal the need for future research exploring the mechanism underlying AVN and MTF in patients with DC/TBDs.