

surgical, particularly post-transphenoidal hypophysectomy, are common etiologies of OD and no effective treatments exist. The results from our pilot study will help better inform the best way to undergo OT, how effective it is, and the planning of future studies.

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### Burden of illness in idiopathic pulmonary fibrosis: A real-world cohort

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**OBJECTIVES/GOALS:** Studying IPF associated health care utilization (HRU) in real world settings, provides the opportunity to produce generalizable results that can directly inform models of care delivery. The objective of this study was to examine real-world differences in the natural history of annual HRU and treatment trends associated with IPF in a large, community-based population of patients with IPF, compared to matched non-IPF controls. **METHODS/STUDY POPULATION:** Cases of IPF were identified using case validated algorithms in the Kaiser Permanente Northern California adult population from 2000 to 2014. Each case was matched to at least one and no more than five non-IPF controls by age, sex, race/ethnicity and length of enrollment. The date of the first occurrence of the IPF-specific diagnostic code was considered the index date for cases and matched controls. Comorbidity burden and HRU was assessed in the five years pre- and post-index date, including hospitalizations, outpatient visits, use of diagnostic and monitoring studies and medications. Poisson generalized estimating equations models with robust standard errors were used to estimate adjusted case-control differences in HRU, accounting for clustering within matched sets. **RESULTS/ANTICIPATED RESULTS:** 691 patients were identified with incident IPF during the study period and matched to 3,452 control subjects. Demographics were well balanced between cases and controls due to matching. Patients with IPF had a higher burden of all selected co-morbidities and higher HRU compared to controls. In the pre-index period, IPF members had significantly higher rates of all diagnostic procedures ( $p < 0.001$ ) and health care visits, with the exception of skilled nursing facility care ( $p < 0.001$ ). The greatest relative difference was observed with use of Chest CT (RR = 245.94, 95% CI 117.04, 516.82). In the post-index period compared to controls, patients with IPF had higher rates of serial testing ( $p < 0.001$ ) and inpatient and outpatient care including, all-cause hospitalization (1.55), emergency room visits (1.19), outpatient visits (1.18), and skilled nursing facility stay (1.35). **DISCUSSION/SIGNIFICANCE OF IMPACT:** Patients with idiopathic pulmonary fibrosis experience increased co-morbidity and healthcare resource utilization compared to controls. This increased burden extends beyond the index-period as previously documented and is true for a large real-world cohort. **CONFLICT OF INTEREST DESCRIPTION:** NA

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### CD4 count is a prognostic marker in persons living with HIV and non-small cell lung cancer in the Bronx

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**OBJECTIVES/GOALS:** There is a high burden of lung cancer in persons living with HIV (PLWH). The role that HIV status, by levels of

immune function and viral load, has on survival from lung cancer is not fully understood. The study's objectives were to assess 1) the association of HIV with survival in non-small cell lung cancer (NSCLC) and 2) prognostic factors in PLWH with NSCLC. **METHODS/STUDY POPULATION:** Participants were from a cohort of lung cancer patients diagnosed between 2004-2017 in the Bronx, NY, with vital status ascertainment at least annually. We compared survival from NSCLC diagnosis between HIV-negative patients (HIV-, N = 2881) and PLWH (N = 88), using Cox regression, accounting for clinical and sociodemographic factors including smoking status. In three separate comparisons to HIV-, PLWH were dichotomized by CD4 count (<200 vs.  $\geq 200$  cells/ $\mu$ L), CD4/CD8 ratio (median, <0.43 vs.  $\geq 0.43$ ) and HIV viral load (VL) suppression (<75 vs.  $\geq 75$  copies/mL). In PLWH only, we assessed the relationships of CD4 count, CD4/CD8 ratio, and VL at diagnosis with survival adjusting for age, sex, and cancer stage. CD4 count and CD4/CD8 ratio were also examined as time-varying variables using a counting process approach. **RESULTS/ANTICIPATED RESULTS:** PLWH were younger (median 56 years, IQR 51-52 vs. 68, IQR 60-76) and more likely to be current smokers (58% vs. 37%) at diagnosis than HIV- patients. Median survival was lower in PLWH [1.1 years, 95% confidence interval (95%CI): 0.6-1.3] than in HIV- [1.6 (1.5-1.7)]. Survival comparing PLWH with higher CD4/CD8 to HIV- was similar [hazard ratio (HR), 95%CI: 0.63 (0.37-1.07)], but those with lower CD4/CD8 experienced worse survival (HR = 1.74, 95%CI: 1.07-3.89). Among PLWH, having a CD4 count <200 cells/ $\mu$ L was associated with over twice the risk of death compared to those with CD4  $\geq 200$  cells/ $\mu$ L (HR = 2.37, 95%CI: 1.14-4.92). VL and CD4/CD8 ratio were not associated with survival. Lower time-updated CD4 count was also associated with worse survival (HR = 2.19 for CD4 <200 vs.  $> 200$  cells/ $\mu$ L, 95%CI: 1.16-4.13). **DISCUSSION/SIGNIFICANCE OF IMPACT:** Among persons with NSCLC, CD4/CD8 ratio nearest diagnosis was shown to distinguish mortality risk in PLWH compared with HIV- patients. In addition, PLWH with low CD4 had worse prognosis than PLWH who had higher CD4 counts. These results suggest HIV immune status to be an essential component influencing survival in lung cancer.

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### Changes in positive predictive value of cervical cytology following HPV vaccination

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**OBJECTIVES/GOALS:** To determine if current U.S. HPV vaccination rates have decreased dysplasia prevalence enough to decrease the positive predictive value (PPV) of abnormal cervical cytology. **METHODS/STUDY POPULATION:** This retrospective cohort study comprised a chart review of all patients 21-35 years of age who had at least 1 Pap test result within MHealth/Fairview 2016-2018. HPV vaccination data, cervical cancer screening data and dysplasia results were abstracted. Vaccinated was defined as receiving at least 1 dose of HPV vaccine, with subgroup analyses performed for those completing vaccination per ACIP guidelines and by age of initiation dichotomized as 21+ years versus <21 years. **RESULTS/ANTICIPATED RESULTS:** 49,764 patients meeting study criteria were identified. Among the entire study population, 10% had abnormal cytology results during the study period. Among the 4,928 patients with abnormal cytology, PPV for CIN2+ was lower among vaccinated individuals (13% vs. 18%;  $p < 0.0001$ ). Among vaccinated

individuals, PPV was lower among those completing vaccination (12% vs. 16% for incomplete vaccination;  $p = 0.04$ ) and among those initiating vaccination at <21 years of age (9% vs 26% for 21+y;  $p < 0.0001$ ). **DISCUSSION/SIGNIFICANCE OF IMPACT:** Among a population with low HPV vaccine coverage, the decrease in dysplasia prevalence among vaccinated individuals is resulting in a subsequent decrease in PPV of cervical cytology, particularly in those initiating vaccination prior to 21 years of age and among those completing the series. Confirmation of these results will call for changes in screening strategies for vaccinated individuals. **CONFLICT OF INTEREST DESCRIPTION:** Acelity: Industry grant for an investigator-initiated industry-sponsored clinical trial. Tesaro: Site PI for industry-sponsored clinical trial. **NOTE:** Funding from the industries above are unrelated to the research presented in the abstract.

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### Chronic Pain in Refugee Torture Survivors

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**OBJECTIVES/GOALS:** An estimated 87% of torture survivors, or 27 million people globally, suffer from chronic pain such as brachial plexopathy from upper extremity suspension or lumbosacral plexus injury from leg hyperextension. However, a vast majority of pain is undetected by evaluators due to a lack of diagnostic tools and confounding psychiatric illness. This diagnostic gap results in exclusive psychological treatment rather than multimodal therapies, substantially limiting rehabilitation, placing vulnerable individuals at higher risk of drug abuse, and increasing healthcare expenditures. We hypothesized that the novel application in torture survivors of a validated pain screen can supplement the UNIP and improve its sensitivity for pain from approximately 15% to 90%, as compared to the reference standard. **METHODS/STUDY POPULATION:** In this prospective, blind comparison to gold standard study, 25 patients who survived torture by World Medical Association definition first received the standard evaluation protocol for torture survivors (United Nations Istanbul Protocol, UNIP) by a trained evaluator, and subsequently received a validated pain screen (Brief Pain Inventory Short Form, BPISF) followed by a non-invasive examination by a pain specialist physician (reference standard). The primary outcome was the diagnostic and treatment capability of the standard protocol (index test) versus the validated pain screen (BPISF), as compared to the reference standard. **RESULTS/ANTICIPATED RESULTS:** Providers using only the UNIP detected and treated pain in a maximum of 16% of patients as compared to 85% of patients who were diagnosed with pain by the reference standard. When employed, the validated pain screen had a sensitivity of 100% [95% CI: 72% - 100%] and a negative predictive value of 100%, as compared to a sensitivity of 24% [95% CI: 8% - 50%] and negative predictive value of 19% by the index test. The difference in the sensitivity of the UNIP as compared to the BPISF was significant, with  $p < 0.001$ . **DISCUSSION/SIGNIFICANCE OF IMPACT :** These data indicate that the current global standard assessment of torture survivors, the United Nations Istanbul Protocol, should be supplemented by the use of a validated pain screen to increase the accuracy of chronic pain diagnosis. This would change the standard medical assessment of 70.8 million people globally, a number that

continues to rise by nearly 45,000 people each day. [ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT03018782) protocol number NCT03018782.

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### Cognitive Function and Relationships with Intervention Dropout, Adherence and Weight Loss

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**OBJECTIVES/GOALS:** Greater cognitive function (CF) is associated with adherence to prescription medications, better program adherence and weight loss (WL) following bariatric surgery. The purpose of this study was to evaluate the association between baseline CF, intervention dropout, adherence and 3-month WL. **METHODS/STUDY POPULATION:** 107 (*Mean* = 40.9 yrs.), overweight/obese (*BMI* = 35.6 kg/m<sup>2</sup>) men (*N* = 17) and women (*N* = 90) completed a 3-mo. WL intervention. Participants were asked to attend weekly behavioral sessions, comply with a reduced calorie diet and complete 100 min of moderate intensity physical activity (PA)/wk. CF tasks including Flanker (attention), Stroop (Executive control) and working memory, body weight and cardiovascular fitness (covariate) were assessed at baseline and 3-mos. Session attendance, adherence to PA and diet prescriptions and number of off-diet episodes were recorded weekly. **RESULTS/ANTICIPATED RESULTS:** Results indicated that attention was positively correlated with session attendance ( $p = 0.016$ ), adherence to the diet ( $p < 0.01$ ) and PA ( $p = 0.023$ ). Executive control was positively correlated with WL ( $p = 0.042$ ). Working memory (two tasks) was also positively correlated with WL ( $p = .017$  and  $p = .025$ ). Analysis of variance (ANOVA) indicated that baseline attention ( $p = .012$ ) was positively related to WL and negatively associated with drop out ( $p < .05$ ). Hierarchical linear regression showed executive control ( $p = .036$ ,  $R^2 = .054$ ) and working memory ( $p = .013$ ,  $R^2 = .073$  and  $p = .017$ ,  $R^2 = .068$ ) were associated with WL when controlling for fitness. **DISCUSSION/SIGNIFICANCE OF IMPACT:** These results suggest that stronger baseline attention is associated with completion of a 3-mo. WL intervention. Executive control and working memory are associated with amount of WL achieved. Additional, larger and longer trials to assess the role of baseline CF on WL and evaluating the impact of interventions designed to improve CF on WL are indicated.

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### Comparative Analysis of Vascular Hemodynamics in a Young Biracial Cohort

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**OBJECTIVES/GOALS:** We investigated hemodynamic measures in young black and white adults below the age of 50 years to identify mechanisms that may predispose blacks to more CVE. **METHODS/STUDY POPULATION:** We recruited 276 young blacks and white adults in Jackson, MS (mean age: 33±9 years; 70% women; 57% Black). Participants had clinical and vascular tonometry parameters obtained. Vascular measures included carotid femoral pulse wave velocity, central and peripheral pulse pressure