index (AHI) in the simulated Type 3 files using a 4% desaturation threshold. Diagnosis of severity of OSA was classified based on indices of <5 as "None", 5-14.99 as "Mild", 15-29.99 as "Moderate", and above 30 as "Severe".

**Results:** 5 records were removed for having a TST <4 hours. Type 2 sleep tests detected significantly more respiratory events (21.0±21.2/hr.) compared to Type 3 tests (13.4 ±17.2; t(549) = 26.8, p<.0001). The use of the Type 2 RDI resulted in 104 patients (18.9% of patients; 39.4% of treatable patients) with moderate OSA falling into the mild category under the Type 3 AHI. The number of treatable patients was thus 71% higher with a Type 2 study. Overall, the diagnoses of Type 2 RDI and Type 3 AHI were only in agreement for 263 out of the 550 records, or 47.8% of the time.

**Conclusion:** The use of a Type 2 study detected more respiratory events than the Type 3 device. Consequentially, 104 patients received a higher severity of obstructive sleep apnea when the EEG information was included. Our results provide support for the use of Type 2 devices for in-home detection of obstructive sleep apnea to provide more accurate diagnostic detection than the more frequently used Type 3 home sleep apnea tests.

**Support (If Any):**

## 0732

### SONOGRAPHIC PHENOTYPING OF THE UPPER AIRWAY IN OSA USING BACKSCATTERED IMAGING ANALYZED BY MACHINE-LEARNING

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**Introduction:** Anatomic characterization of the upper airway remains important in directing and monitoring care of patients with obstructive sleep apnea (OSA). Nasopharyngoscopy is routine in clinical practice, but it is invasive, non-reproducible, and only allows subjective assessment. We used machine-learning enabled ultrasonography to correlate upper airway tissue characteristics with OSA severity.

**Methods:** Sixty-three subjects (14 female) with a mean age of 39.4±12.6 years, BMI of 26.4±4.6 kg/m2, and AHI of 19.0±16.1 were consented from Stanford Sleep Surgery (July 2020 to May 2021). Standardized ultrasound protocol was used to image the soft palate, oropharynx, and tongue-base. Via machine learning, an FDA-cleared backscattered ultrasound imaging (BUI) of the upper airway was performed. Combined with B-mode measurements of airway muscular cross-sections, a logistic regression model was built to correlate with OSA severity.

**Results:** BUI of subjects with mild OSA was different from moderate-severe (AHI≥15) OSA at the soft palate (p=0.0007). The axial-to-lateral ratio of upper airway length was reduced in the lower soft palate of the moderate-severe group (p =0.0207). The logistic regression model with BUI, axial-to-lateral ratio at the soft palate, and BMI showed an Area Under the Receiver Operating Characteristic (AUROC) curve of 0.84 (95% CI 0.726 to 0.920) in moderate-severe OSA.

**Conclusion:** A non-invasive yet replicable technique to visualize and phenotype the upper airway is critical in the management of patients with sleep-disordered breathing. Sonographic BUI combined with B-mode airway measurements analyzed by machine learning show promise in characterizing the upper airway in patients with moderate-severe OSA.

**Support (If Any):**

## 0733

### ELUCIDATING SLEEP-RELATED HEALTH DISPARITIES ACROSS THE SOCIOECONOMIC SPECTRUM LEVERAGING A LARGE-SCALE SLEEP REGISTRY

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**Introduction:** Sleep disparities have been implicated as a contributor to overall health disparities in socially disadvantaged groups. Despite epidemiological studies reporting sleep deprivation and poorer sleep quality among those with low socioeconomic status and group minorities, little is known about the extent to which sleep disorders such as sleep-disordered breathing (SDB), varies across the socioeconomic spectrum.

**Methods:** A retrospective cohort study was conducted utilizing data from the Cleveland Clinic Sleep Laboratory Registry. All adults who underwent diagnostic or split (baseline diagnostic) polysomnogram (PSG) or home sleep apnea test (HSAT) were included in the study. Area Deprivation Index (ADI), a biomarker of neighborhood socioeconomic disadvantage, was calculated by national rank, i.e. 25th, 50th and 75th percentiles; higher quartiles reflect greater deprivation. Generalized linear models adjusted for age, race, sex, body mass index(kg/m2) and primary payer were used to investigate association of ADI with SDB breathing measures (apnea hypopnea index, (AHI) and sleep-related hypoxemia (percentage of total sleep time <90%SaO2, [TST<90]).

**Results:** The analytic sample included 81,212 sleep studies; 60,013(74%) were PSG and 21,199(26%) HSAT with age: 52.0[41.0, 62.3], 49% females, 19% black race, with BMI=34.5±8.5 kg/m2, 44% with Medicaid and Medicare. Median ADI National Rank 59.0[39.0, 81.0] with higher 4th quartiles in PSG versus HSAT:29.1% vs 16.3%,p<0.001. In the PSG group, ADI was associated with hypoxia measures: TST<90(coefficient p<0.0001), model R2=0.171; mean SaO2(p<0.0001), R2=0.189; minimum SaO2(p<0.0001), R2=0.169; all measures were higher with higher ADI quartiles. In the HSAT group, ADI was associated with mean SaO2(p<0.0001), R2=0.188 and minimum SaO2(p<0.0001), R2=0.181 with all measures being higher with higher ADI quartiles. AHI was associated with ADI(p=0.0032), R2=0.239; but least squares mean AHI did not differ among ADI quartiles in PSG and HSAT groups. Interactions were observed between ADI and age, BMI and male sex (p<0.05), but not race.

**Conclusion:** Sleep-related hypoxia was greater among patients living in areas of higher deprivation when considering rankings of neighborhoods by socioeconomic disadvantage. Further understanding of the reason for this sleep disorder-related disparity is needed, i.e. further characterizing theoretical domains and social and geographic determinants of income, education, employment, and housing quality with the overarching goal to improve disparities in health.

**Support (If Any):**

## 0734

### EXAMINING THE DIAGNOSTIC VALIDITY OF THE WATCHPAT IN A PRELIMINARY SAMPLE OF COGNITIVE NORMAL BLACK/AFRICAN-AMERICAN OLDER ADULTS

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**Introduction:** The WatchPAT® is an innovative Home Sleep Apnea Device (HSAT) that utilizes the peripheral arterial signal (PAT®)