

# SLEEP

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## Scientific Highlights/Abstracts of Original Investigations

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such as risk-taking assessment. Subjective diurnal sleepiness, mental fatigue, and activation levels during the simulation were also assessed by questionnaires.

**Results:** Although apnea patients exhibited a great degree of diurnal sleepiness, risk-taking behaviors were similar between groups. There were no differences in mental fatigue or activation levels during the simulation.

**Conclusion:** Contrary to previous findings, performance of apnea patients do not differ from matched controls when realistic road environments are used in the evaluation process. These results seem to warrant the use of CPAP, and suggest the inclusion of virtual simulation tests in order to obtain or extend the driving license, especially in populations at risk.

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## 0545

### CLINICAL IMPLICATIONS OF UNDIAGNOSED OBSTRUCTIVE SLEEP APNEA IN PATIENTS UNDERGOING CONSCIOUS SEDATION FOR BRONCHOSCOPY

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**Introduction:** The use of conscious sedation during bronchoscopy may increase morbidity in patients with obstructive sleep apnea (OSA). However, OSA is frequently undiagnosed at the time of presentation. We aimed to determine if adult patients with undiagnosed OSA have a longer post-procedural recovery time when compared to those without OSA.

**Methods:** We screened all patients referred for outpatient bronchoscopy. Exclusion criteria included pre-existing sleep disorders and the inability to perform a home sleep study. Following informed consent, patients had an unattended home sleep test (HST). Sleep apnea was defined as an apnea-hypopnea index greater than 5. Bronchoscopy was performed in usual fashion with HST results not provided to the bronchoscopist. Post-procedural recovery from conscious sedation was assessed using the Modified Aldrete Scoring System. Data is presented as mean±standard deviation and compared using Student's unpaired t-test.

**Results:** A total of 29 patients completed the full study protocol. All patients were male with an average age of 65±11 years and a body mass index of 26.2±5.2 kg/m<sup>2</sup>. No statistically significant demographic differences were noted between patients with and without OSA. Forty-four percent (13/29) were diagnosed with an average AHI of 14.3 (range of 5-42). Pre-operative and intra-operative oxygen saturation, end tidal CO<sub>2</sub> and total bronchoscopy times were not statistically different between groups. Administered dosages of midazolam and fentanyl were statistically similar. Recovery times showed no statistical difference, averaging 4.1±2.4 minutes to reach recovery criteria for both groups (p=0.5). There were no operative complications necessitating hospital admission.

**Conclusion:** Patients with undiagnosed OSA undergoing conscious sedation did not have statistically different recovery times when compared to a similar control population. In addition, no differences in intra-operative respiratory variables and no operative complications requiring hospital admission were noted. It is safe to perform procedures requiring conscious sedation in patients that may have undiagnosed OSA.

## 0546

### HYPOXIA AND SLEEPINESS IN PATIENTS WITH OSA

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**Introduction:** Patients with obstructive sleep apnea (OSA) exhibit varying degrees of sleepiness. Our goal was to determine whether sleepiness in patients with moderate-to-severe OSA was correlated with common measures of hypoxia, taken either alone or in combination.

**Methods:** Computer-based chart reviews identified a consecutive series of OSA patients with AHI≥15 during a cardiopulmonary sleep study (Embletta) which we evaluated (N=114). The measures used were: de-saturation index; P90 (minutes below 90% saturation); average %-desaturation; lowest %-desaturation; and AHI. To score hypopneas, a desaturation criteria of ≥4% was used. Sleepiness was assessed using the Epworth Sleepiness Scale (ESS). Correlations between ESS score and these measures were determined using the Pearson correlation coefficient (PCC). The PCC was calculated for each measure and for all possible combination (31 cases). For each combination we determined the PCC between a biomarker formed by principal components analysis and the ESS score.

**Results:** None of the individual measures correlated with the ESS score. Of the 10 possible pair-wise combinations, half correlated with ESS score; the highest significant PCC (0.3) was the biomarker formed using average %-desaturation and P90. Of the 10 combinations involving three measures, 4 were significant; the highest significant PCC was the one formed by the addition of the AHI. Addition of desaturation index and lowest %-desaturation either individually or together (six cases) did not further increase the PCC.

**Conclusion:** Individual measures studied do not capture enough of the complex physiological relationship between OSA and sleepiness to yield a statistically significant correlation between the two conditions. Biomarkers formed by linear combinations of 2-3 measures were correlated with sleepiness, indicating that the relationship can be characterized more effectively by combining measures. Nevertheless the PCCs were low, suggesting that individual these measures alone (however combined) are unlikely to explain sleepiness well in patients with moderate-to-severe OSA.

## 0547

### FACTORS ASSOCIATED WITH EXCESSIVE DAYTIME SLEEPINESS IN PATIENTS WITH SEVERE OBSTRUCTIVE SLEEP APNEA (OSA)

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**Introduction:** Although excessive daytime sleepiness (EDS) is regarded as one of the key symptoms of OSA, associations between OSA and EDS have been inconsistent. The Sleep Heart Health Study investigators have reported that only 35% of patients with severe OSA develop EDS. The explanation for this phenomenon is unclear. To that end, our goal was to investigate factors associated with EDS based on the Epworth Sleepiness Scale (ESS) score in a large clinical population with severe OSA.

**Methods:** This cross-sectional study included 1126 adult patients referred for their first in-laboratory polysomnography. All patients completed a questionnaire including demographics, race, co-morbidities, sleep history, ESS, short-form quality of life questionnaire-12 (SF-12), the center for epidemiologic studies depression (CES-D) scale, and medications used. 498 patients had severe OSA (apnea hypopnea index [AHI] ≥ 30). After excluding patients taking narcotics, hypnotics, ben-