

investigated. This study aims to assess the ability of short home-based video sleep recordings to predict PSG-diagnosed OSA in a population of healthy children.

**Methods:** Healthy children aged 1–18 years undergoing PSG to assess for OSA were recruited. Those with comorbidities likely to cause/exacerbate OSA, aside from adenotonsillar hypertrophy and obesity, were excluded. Thirty-minute video recordings of sleep shortly after sleep onset capturing the face and exposed torso were obtained. A previously validated scoring system was modified to include six parameters: snore, inspiratory noise, respiratory events, respiratory effort, mouth breathing and neck extension.

**Results:** We report interim results of this ongoing study. Of the 51 children meeting inclusion criteria, videos for 44 (28M, mean (SD) age 8.58 (2.96) years) were deemed satisfactory and analysed. Four (9%) children had OAH1 >5 episodes/h on PSG and median Total Video Score (TVS) was 0 (IQR 0–1). TVS and OAH1 >5 episodes/h on PSG showed a statistically significant association (OR 2.782,  $p=0.006$ ) with area under the curve of 0.847. TVS  $\geq 4$  showed sensitivity of 75% and specificity of 100% for OAH1 >5 episodes/h.

**Discussion:** This video scoring system, when applied to short home-based video sleep recordings, showed acceptable diagnostic accuracy for PSG-diagnosed OSA. Full data analysis will further clarify the role of this modality as a screening tool for paediatric OSA.

### P030

#### THE EFFECTS OF CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) THERAPY IN MODERATE TO SEVERE OBSTRUCTIVE SLEEP APNEA (OSA): A HIGH-DENSITY ELECTROENCEPHALOGRAPHY (EEG) STUDY

*D'Rozario A<sup>1,2</sup>, Kao C<sup>2</sup>, Mullins A<sup>3</sup>, Memarian N<sup>2</sup>, Yee B<sup>2,4,5</sup>, Duffy S<sup>2</sup>, Banerjee D<sup>2</sup>, Cho G<sup>2</sup>, Wong K<sup>2,4,5</sup>, Kremerskothen K<sup>2</sup>, Chapman J<sup>2</sup>, Haroutonian C<sup>1,2</sup>, Bartlett D<sup>2,5</sup>, Naismith S<sup>1</sup>, Grunstein R<sup>2,4,5</sup>*

<sup>1</sup>School of Psychology, Faculty of Science, The University Of Sydney, Sydney, Australia, <sup>2</sup>CIRUS, Centre for Sleep and Chronobiology, Woolcock Institute of Medical Research, Sydney, Australia, <sup>3</sup>Icahn School of Medicine, Mount Sinai, New York City, United States of America, <sup>4</sup>Department of Sleep and Respiratory Medicine, Royal Prince Alfred Hospital, Sydney, Australia, <sup>5</sup>Faculty of Medicine and Health, The University Of Sydney, Sydney, Australia

**Introduction:** A previous high-density EEG investigation in OSA showed regional sleep EEG deficits particularly slow wave activity (SWA) in the parietal region. It is unclear whether CPAP treatment can reverse local sleep EEG abnormalities, and whether any recovery is related to improved cognitive function.

**Methods:** Fifteen males with moderate-severe OSA (age  $50.4 \pm 6.5$  yrs, AHI  $51.7 \pm 23.5$ /h) underwent polysomnography with 256-channel high-density EEG at baseline and following 3 months of CPAP. Tasks assessing cognitive performance and sleep-dependent memory were administered. Topographical spectral power maps were calculated for standard frequency ranges for sleep stages. Differences in normalized power between baseline and treatment were determined by statistical nonparametric mapping.

**Results:** In 11 CPAP compliant patients (data loss: intolerant of CPAP [ $n=3$ ]/high-density EEG [ $n=1$ ]), total sleep time did not change after CPAP but N1 (baseline vs. treatment: 66.9 vs. 39.5 mins,  $p=0.008$ ) and N2 (195.0 vs. 150.6 mins,  $p=0.002$ ) sleep was lower and N3 (89.8 vs. 128.7 mins,  $p=0.003$ ) was higher. Topographic high-density EEG analysis revealed a regional increase in SWA (1–4.5Hz) during N3 sleep in a cluster of 22 electrodes overlying

the parietal cortex (paired t-test,  $t(10)=-3.9$ ,  $p=0.0029$ ). The change in N3 SWA in the parietal cluster after CPAP was correlated with improved overnight procedural memory on the motor sequence task ( $\rho=0.79$ ,  $p=0.03$ ) and better executive functioning (Stroop accuracy,  $\rho=0.73$ ,  $p=0.01$ ).

**Conclusion:** CPAP treatment reduces localised deficits in sleep EEG, and specific regional recovery relates to short-term improvements in memory and executive function. These data also highlight the potential for long-term therapeutic effects on cognitive outcomes.

### P031

#### ASSOCIATIONS BETWEEN SOUND PRESSURE LEVELS AND AMPLITUDE MODULATION FROM WIND FARM NOISE AND AMBULATORY RECORDED OBJECTIVE MACRO-SLEEP PARAMETERS

*Dunbar C<sup>1</sup>, Catcheside P<sup>1</sup>, Vakulin A<sup>1</sup>, Zajamsek B<sup>1</sup>, Hansen K<sup>2</sup>, Lack L<sup>1</sup>, Scott H<sup>1</sup>, Micic G<sup>1</sup>*

<sup>1</sup>Flinders Health and Medical Research Institute: Sleep Health, Flinders University, Adelaide, Australia, <sup>2</sup>College of Engineering, Flinders University, Adelaide, Australia

**Introduction:** This study used ambulatory sleep studies to examine potential relationships between wind farm sound pressure level (SPL) in dBA and amplitude modulation (AM) on conventional measures of sleep quality in individuals residing within 10 km of a wind turbine in Australia.

**Methods:** Twenty six individuals (42:58%, females:males) aged (mean  $\pm$  standard deviation)  $53.2 \pm 12.2$  years and residing  $2.9 \pm 1.7$  km from the nearest wind turbine underwent two consecutive ambulatory sleep studies and detailed indoor time-synchronised acoustic recordings inside their home. Associations between averaged whole night SPL and AM prevalence versus sleep onset latency, wake after sleep onset (WASO), percentage of sleep in each stage, sleep efficiency and total sleep time on each recording night were explored using bivariate and multiple regression analyses, using log-normalised data where required.

**Results:** Forty-five technically successful sleep studies (24 night 1, 21 night 2) were available for analysis. On night 2, AM prevalence explained 18.9% of the variance in sleep efficiency ( $R=0.434$ ,  $F(1,19)=4.421$ ,  $p=0.049$ ) and SPL explained 23.5% of the variance in WASO ( $R=0.484$ ,  $F(1,19)=5.821$ ,  $p=0.026$ ) in multiple regression analyses adjusting for age. No other sleep macrostructure variables were associated with AM prevalence or SPL on either night.

**Conclusion:** Weak relationships between SPL and AM prevalence and sleep outcomes in a real-world wind farm noise exposure setting support the need for more detailed investigations of potential wind farm noise effects on sleep quality.

### P032

#### ADEQUATE HEALTH LITERACY PREDICTS ADHERENCE TO CONTINUOUS POSITIVE AIRWAY PRESSURE IN ADULTS WITH OBSTRUCTIVE SLEEP APNOEA

*Ellender C<sup>1</sup>, Le Feuvre S<sup>1</sup>, Boyde M<sup>1</sup>, Winter S<sup>2</sup>, Duce B<sup>1</sup>, Hukins C<sup>1</sup>*

<sup>1</sup>Princess Alexandra Hospital, Brisbane, Australia, <sup>2</sup>The Prince Charles Hospital, Brisbane, Australia

**Study Objectives:** Obstructive sleep apnoea (OSA) is a chronic disease with significant health implications and adequate adherence to continuous positive airway pressure (CPAP) is essential for effective treatment. In many chronic diseases, health literacy has

been found to predict treatment adherence and outcomes. In this study, the aim was to determine the health literacy of a sleep clinic population and evaluate the association between health literacy and CPAP adherence.

**Methods:** A prospective cohort study was undertaken, recruiting 104 consecutive patients with a variety of sleep diagnoses attending the clinic. The Short Form Rapid Estimate of Adult Literacy in Medicine (REALM-SF), a validated questionnaire was administered to measure health literacy. In a sub-group of 91 patients prescribed CPAP for OSA, CPAP usage was measured, with adequate usage defined as greater than 4hrs/night CPAP therapy.

**Results:** 71% of the sleep clinic cohort was found to have adequate health literacy as measured by the REALM-SF. In those prescribed CPAP for OSA, inadequate health literacy was associated with a two fold increase risk for inadequate CPAP usage (adjusted odds ratio 2.75, 95% CI: 1.00 - 7.6,  $p = 0.05$ ). There was a 1.7hr/night difference in median CPAP usage comparing those with adequate to inadequate health literacy (4.6hrs versus 6.3hrs/night).

**Conclusions:** The majority of this sleep disorders cohort had adequate health literacy as measured by the REALM-SF questionnaire. However inadequate health literacy appears to be an independent predictor of treatment adherence, and may represent a potentially modifiable risk factor of poor treatment outcomes in OSA.

### P033 RANDOMISED CONTROLLED TRIAL ON THE EFFICACY OF AUDIO-VISUAL HEALTH EDUCATIONAL MATERIALS ON CPAP ADHERENCE: THE AHEAD TRIAL

*Ellender C<sup>1</sup>, Samaranyake C<sup>1</sup>, Duce B<sup>1</sup>, Boyde M<sup>1</sup>, Winter S<sup>2</sup>, Hukins C<sup>1</sup>*

<sup>1</sup>Princess Alexandra Hospital, Brisbane, Australia, <sup>2</sup>The Prince Charles Hospital, Brisbane, Australia

OSA is a prevalent chronic disease with significant health implications, for which achieving >4 hours/night on continuous positive airway pressure (CPAP) is essential for effective treatment. Educational videos to improve CPAP adherence are of interest as a low-cost intervention, however trials have shown mixed results. This study aimed to compare CPAP usage following standard of care education (SOCE), with the usage following the addition of educational videos, customised to incorporate low health literacy communication, motivational and self-efficacy techniques.

**Methods:** Adults with OSA recommended treatment with CPAP, were recruited and randomised in a single blinded method, to watch short educational videos following their in laboratory CPAP study or SOCE. The primary outcome was CPAP usage at 2mths and secondary outcomes were usage at 12mth and proportion of patients with adequate usage >4hrs/night.

**Results:** 195 patients met the eligibility criteria and were randomised to video education ( $n = 96$ ) or to SOCE ( $n = 99$ ). There was no significant difference in compliance at 2mths (median usage 1.7hrs IQR 0-6.2 SOCE, 4.4hrs IQR 0-6.7 video education  $p = 0.1$ ), however at 12mths there was increased usage in the video education arm (median 0hrs IQR 0-5.4 standard of care, 3.8hrs IQR 0-6.87  $p = 0.05$ ). The proportion with adequate CPAP usage >4hrs/night at 12mths was higher in the video education group (33, 33% versus 48, 50%  $p = 0.01$ ).

**Conclusions:** Long-term adherence to CPAP is enhanced by the addition of educational videos that incorporate low health literacy communication and motivational techniques, compared to SOCE.

### P034 INTER-SCORER CONCORDANCE IMPACTS MSLT RESULTS

*Eriksson N<sup>1</sup>, Teuwen P<sup>1</sup>, Mateus E<sup>1</sup>, Shim C<sup>1</sup>, Scott A<sup>1</sup>*

<sup>1</sup>Thoracic And Sleep Group, Auchenflower, Australia

**Title:** Inter-scorer concordance impacts MSLT results

**Introduction:** A retrospective study on the effect of inter-scorer concordance and impact of analysing polysomnography (PSG) data prior to the Multiple Sleep Latency Test (MSLT) on clinical interpretation of Narcolepsy (N) and Idiopathic Hypersomnolence (IH).

**Methods:** Data of four individuals was randomly selected from a cohort of patients that participated in MSLT studies. De-identified MSLT fragments from four nap periods ( $n=16$ ) were scored in two groups: analysis of PSG conducted prior to the respective MSLT fragments, and analysis without access to prior PSG. Individual scorers were compared to a master score set, by consensus from two experienced sleep scientists.

Spearman correlation and percentage agreement statistics were applied to calculate the inter-scorer concordance in sleep latency and REM latency. Mann-Whitney test was utilised to assess differences between the two groups. A positive result was assigned as: mean ( $n=4$ ) sleep latency of <10min (IH), and mean ( $n=4$ ) sleep latency of <8min including ( $n=2$ ) SOREMs (N).

**Results:** From 16 sets of data, four false positive results were identified when PSG was not analysed prior to scoring the MSLT fragments. Additionally, statistically significant differences were present when PSG analysis was conducted prior to scoring MSLT sleep latency and REM latency data.

**Discussion:** These results support a recommendation that PSG analysis (sleep and REM latency) should be encouraged prior to MSLT studies and performed by the same sleep scientist. Furthermore, including MSLT data in intra-lab concordance activities is important, particularly in relation to medical interpretation and practice.

### P035 IS THE GRAEL OXIMETRY AVERAGING TIME INTERCHANGEABLE WITH A MASIMO PULSE OXIMETER ALGORITHM IN POLYSOMNOGRAPHY?

*Eritiaia J<sup>1</sup>, Suthers B<sup>1</sup>*

<sup>1</sup>John Hunter Hospital, Lambton Heights, Australia

Compumedics recording software (Grael V2) for polysomnography (PSG) calculates SpO2 values using a 3-heartbeat long averaging window. This is derived from the ECG and thus introduces variability in the averaging time that is dependent on the heart rate. Little is known about the effect this has on the common oximetry metrics used in PSG interpretation. This study explored the interchangeability of the Grael V2 inbuilt 3-beat averaging algorithm with a short averaging window of 2 - 4 seconds using a Masimo Radical 7 pulse oximeter during a PSG.

SpO2 data were collected from 2 oximeter probes (Grael and Radical 7) both attached to a patient's fingers. After SpO2 artifacts were removed, the following SpO2 parameters from each oximeter were generated: mean sleep SpO2, oxygen desaturation index (ODI) using 2%, 3% and 4% drop in SpO2 in sleep, total sleep time (TST) with SpO2 < 90% and < 80% as well as time spent < SpO2 88% in minutes. 88 sleep studies were included in the data collection.