patients who had refused continuous positive airway pressure therapy(CPAP).
We studied 5 male patients (age: 60 to 72years, BMI: 25.8 to 32.2kg/m2). Standard, in-laboratory, overnight-polysomnography was performed (Compumedics Ltd, Australia). Posture was monitored, but not restricted, and bed position was set at horizontal(HB) for half the night and at 7° HUT for the remainder (randomised). Polysomnograms were scored by a sleep technician using AASM criteria. SDB severity was quantified using the apnoea hypopnoea index(AHI) and apnoea index(AI). For this analysis, we focus on periods of supine, stage 2 sleep (S2S) only.
Participants spent 23 to 60minutes (range) in S2S with HB and 11 to 36minutes with HUT. AHI was 49 to 138events/hr with HB and 24 to 120events/hr with HUT, representing a fall of 2 to 62events/hr across all patients. AI was 19 to 111events/hr with HB and 0 to 48 events/hr with HUT, a fall of 15 to 96events/hr across all patients.
In these CPAP non-compliant, SDOSA patients, S2S in HUT was associated with a reduction in SDB severity that varied between individuals. Notably apnoeic events were reduced in all patients and eliminated in two patients. We conclude that HUT warrants further investigation as a potential alternative therapy for SDOSA patients intolerant of CPAP.

P055

MECHANISMS UNDERLYING SLEEP DISTURBANCE IN YOUNG PEOPLE WITH BORDERLINE PERSONALITY DISORDER FEATURES

***Jenkins C*[1,2,3]*, Thompson K*[2,3]*, Nicholas C*[1,4]*, Chanen A*[2,3]
[1]Melbourne School of Psychological Sciences, The University Of Melbourne, Parkville, Australia, [2]Orygen, Parkville, Australia, [3]Centre for Youth Mental Health, The University of Melbourne, Parkville, Australia, [4]Institute for Breathing and Sleep, Heidelberg, Australia

Introduction: Sleep problems are common in young people (aged 15–25 years) with features of borderline personality disorder (BPD). Yet the mechanisms underlying this relationship remain largely unknown. This study explored the indirect roles of emotion regulation difficulties, depression, anxiety and stress in the relationship between BPD features and sleep disturbance in young people.
Method: Sleep was measured subjectively (self-report) and objectively (10 days wrist actigraphy) in 40 young people with BPD features (36 females, Mage = 19.77, SD = 2.51) and 38 healthy young people (34 females, Mage = 20.06, SD = 2.52). Participants also completed the Difficulties in Emotion Regulation Scale and the Depression, Anxiety and Stress Scale.
Results: Mediation analyses revealed that impulse control difficulties, limited access to emotion regulation strategies, and anxiety played an indirect role in subjective sleep disturbances in young people with BPD features. Lack of emotional awareness and anxiety indirectly contributed to associations between BPD features and objectively longer time in bed and bedtime variability, respectively.
Discussion: Targeting impulse control difficulties, emotion regulation strategies and anxiety through improving impulse control, improving emotion regulation skills and reducing pre-sleep arousal might be beneficial for improving subjective sleep in this population. Similarly, improving emotional awareness and reducing anxiety might help to normalise objective sleep patterns. Overall, these findings help to guide the development of targeted sleep-improvement strategies that might serve as useful adjuncts to current interventions for young people with BPD features.

P056

USING POLYSOMNOGRAPHY IN YOUNG PEOPLE WITH BORDERLINE PERSONALITY DISORDER: A PILOT AND FEASIBILITY STUDY

***Jenkins C*[1,2,3]*, Thompson K*[2,3]*, Chanen A*[2,3]*, Nicholas C*[1,4]
[1]Melbourne School of Psychological Sciences, The University Of Melbourne, Parkville, Australia, [2]Orygen, Parkville, Australia, [3]Centre for Youth Mental Health, The University Of Melbourne, Parkville, Australia, [4]Institute for Breathing and Sleep, Heidelberg, Australia

Introduction: Few studies have assessed sleep in young people (aged 15–25 years) with BPD using polysomnography. The feasibility of using polysomnography in this population might be questioned due to polysomnography's invasiveness, anxiety and sensory sensitivities in BPD, and misconceptions that individuals with BPD are uncooperative and non-compliant. This study aimed to provide pilot sleep quality and architecture data and assess polysomnography feasibility.
Method: Participants were 13 females aged 15–25, 7 (Mage = 19.97, SD = 3.15) with BPD and 6 age-matched healthy controls (Mage = 20.13, SD = 3.31). Participants completed two non-consecutive nights of polysomnography monitoring (second night's data were used in analyses). Participants were given the option of completing polysomnography monitoring at home or in a sleep laboratory.
Results: Young people with BPD displayed less arousals across the night and specifically during NREM sleep compared with healthy young people. All other sleep parameters were comparable across groups. There was considerable heterogeneity among participant preferences for in-home vs. sleep laboratory-based monitoring, due to comfort, safety, convenience, interest in seeing a sleep laboratory, or their living situation (eg. presence of bed partner at home). Anxiety was identified as a potential barrier to polysomnography research in this population.
Discussion: There were some indications of more consolidated sleep in BPD, which might reflect a greater sleep need in this population. The feasibility and tolerability of in-home and sleep laboratory-based polysomnography were demonstrated. Future protocols should incorporate ways to minimise anxiety, for example through providing a choice of monitoring location.

P057

VIRUS AEROSOL PROPAGATION BY CPAP IS PROPORTIONAL TO MASK LEAK AND CAN BE PREVENTED BY USE OF A HOOD AND AIR FILTRATION SYSTEM

***Landry S*[1]*, Barr J*[2]*, MacDonald M*[3]*, Hamilton G*[3,4]*, Mansfield D*[3]*, Edwards B*[1]*, Joosten S*[3,4]
[1]Department of Physiology, School of Biomedical Sciences & Biomedical Discovery Institute, Monash University, Clayton, Australia, [2]School of Biological Sciences, Monash University, Clayton, Australia, [3]Monash Lung Sleep Allergy Immunology, Monash Health, Clayton, Australia, [4]School of Clinical Sciences, Monash University, Clayton, Australia

Virus aerosol propagation by CPAP is proportional to mask leak

Introduction: Nosocomial transmission of SARS-CoV-2 has caused significant morbidity/mortality in the COVID-19 pandemic. Because patients auto-emit aerosols containing viable virus, these aerosols can be further propagated when patients undergo certain treatments including continuous positive airway pressure (PAP) therapy. This study aimed to assess the degree of viable virus propagated from mask leak in a PAP circuit.
Methods: Bacteriophage PhiX174 (108copies/mL) was nebulised into a custom PAP circuit. Mask leak was systematically varied to 0, 7, 21, 28 and 42 L/min at the mask interface. Plates containing Escherichia coli assessed the degree of viable virus settling on surfaces around the room. In order to contain virus spread a ventilated headboard and high efficiency particulate air (HEPA) filter was tested.
Results: Increasing mask leak was associated with virus contamination in a dose response manner ($\chi 2$= 58.24, df=4, $p<0.001$). Clinically relevant levels of leak (≥21 L/min) were associated with virus counts equivalent to using PAP with a standard vented mask. Viable viruses were recorded on all plates (up to 3.86m from source). A plastic hood with HEPA filtration significantly reduced viable viruses on all plates. HEPA exchange rates of 170 and 470m3/hr eradicated all evidence of virus contamination.
Discussion: Mask leak from PAP circuits may be a major source of environmental contamination and nosocomial spread of infectious respiratory diseases. Subclinical levels of leak should be treated as an infectious risk. Cheap and low-cost patient hoods with HEPA filtration are an effective countermeasure.

P058

NEURAL APERIODIC ACTIVITY AS A NOVEL OBJECTIVE MEASURE OF DAYTIME SOMNOLENCE

Kang T[1], *Sarkar P*[1], *Cross Z*[2], *Chatburn A*[2], *Singh P*[1], *Johnston S*[1], *Lushington K*[3], *Yeo A*[1]

[1]Royal Adelaide Hospital, Adelaide, Australia, [2]Cognitive and Systems Neuroscience Research Hub, University of South Australia, Adelaide, Australia, [3]Discipline of Psychology, Unit of Justice and Society, University of South Australia, Adelaide, Australia

Background: Current assessment of excessive daytime somnolence (EDS) requires subjective measurements like the Epworth Sleepiness Scale (ESS), and/or resource heavy sleep laboratory investigations. Electroencephalographic (EEG) measures index intrinsic properties of the central nervous system. One such component is aperiodic neural activity which is thought to reflect excitation/inhibition ratios of neural populations and is altered in various states of consciousness. From this perspective, resting-state aperiodic activity may be a potential biomarker for hypersomnolence. We aim to analyse retrospective EEG data from patients who underwent a Multiple Sleep Latency Test (MSLT) and determine if aperiodic activity is predictive of subjective and objective measures of EDS.
Methods: Participants having undergone laboratory polysomnogram (PSG) and next day MSLT will be grouped into those with and without sleepiness (mean sleep latency (MSL) of < 8min and > 10min respectively). Forty patients in each group (n=80) will be assessed. The primary objective is to compare the aperiodic slope between these groups, and secondary objectives comparing aperiodic activity with ESS and time of day.
Data will be analysed using linear mixed-effect models. Simple linear regressions will be performed between the aperiodic slope and MSL and ESS, with R2 values used to estimate of effect size.
Progress: Formal ethics approval has been submitted and is pending.
Intended Outcome and Impact: In this exploratory study we hypothesise that EDS is associated with a lower aperiodic exponent/flatter slope, and hope to provoke further investigation of this metric as a novel biomarker for sleepiness.