## P086

### THE ORGANIZATION OF SLEEP-WAKE PATTERNS AROUND DAILY SCHEDULES IN COLLEGE STUDENTS

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A potential contributor to insufficient sleep among college students is their daily schedule, with sleep sacrificed for other waking activities. We investigated how daily schedules predict day-to-day sleep-wake timing in college students. 223 undergraduate college students (M±SD = 19.2±1.4 years, 37% females) attending a Massachusetts university in the US between 2013–2016 were monitored for approximately 30 days during semester. Sleep-wake timing was measured using daily online sleep diaries and wrist-actigraphy. Daily schedules were measured using daily online diaries that included self-reported timing and duration of academic, exercise-based, and extracurricular activities, and duration of self-study. Linear mixed models were used to examine the association between sleep-wake patterns and daily schedules at both the between-person and within-person levels. An earlier start time of the first-reported activity predicted earlier sleep onset (between and within: $p<.001$) and shorter total sleep time (within: $p<.001$) for the previous night, as well as earlier wake onset on the corresponding day (between and within: $p<.001$). A later end time of the last-reported activity predicted later sleep onset (within: $p=.002$) and shorter total sleep time (within: $p=.02$) on that night. A more intense daily schedule (i.e., greater total duration of reported activities) predicted an earlier wake onset time (between: $p=.003$, within: $p<.001$), a later sleep onset time (within: $p<.001$), a shortened total night-time sleep duration (between: $p=.03$, within: $p<.001$), and greater sleep efficiency (within: $p<.001$). These results indicate that college students may organize their sleep and wake times based on their daily schedule.

## P087

### A VALIDATION STUDY OF THE LIMITED CHANNEL SINGLE AND MULTI-USE NIGHTOWL SLEEP TESTING SYSTEMS COMPARED TO LABORATORY POLYSOMNOGRAPHY IN THE DIAGNOSIS OF OBSTRUCTIVE SLEEP APNOEA

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**Background:** Obstructive sleep apnoea (OSA) is common, and its prevalence is increasing. Opportunities to screen for OSA using simplified diagnostic devices may be important to addressing this clinical burden. The NightOwl (Ectosense NV, Leuven, Belgium) is a small dual channel device that acquires data from a single fingertip and is available in a disposable version, in addition to the previously validated reusable option. The devices will provide a measure of sleep duration and derived apnoea-hypopnoea index (AHI) using a proprietary algorithm.

**Methods:** A prospective cohort study of patients undergoing laboratory polysomnography (PSG) for suspected OSA is underway at Monash Medical Centre, Clayton (ACTRN12621000444886). Participants are fitted with a NightOwl Sensor Mini (disposable) and a NightOwl Sensor Reusable on their index and middle fingers, in addition to the standard PSG setup (Compumedics Grael, Profusion 3). The primary outcome is the level of agreement between the NightOwl Sensor Mini, NightOwl Sensor Reusable and PSG derived AHI. We also intend to compare the proprietary algorithm against Compumedics Profusion 3 for determination of oxygen desaturation index. Level of agreement will be determined utilising Bland-Altman plots.

Progress to date

Recruitment is currently underway with 29 of an intended 100 participants having completed their sleep studies.

Intended outcome and impact

The intended outcome of this study is to externally validate the two NightOwl devices against PSG for detecting OSA and accurately assessing severity. We anticipate this will enable screening for OSA in an efficient and cost-effective manner.

## P088

### PRESENCE VERSUS ABSENCE OF FLOW LIMITATION DURING STABLE BREATHING IN PATIENTS WITH OBSTRUCTIVE SLEEP APNOEA

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**Introduction:** Flow limitation is the distinguishing characteristic of obstructive sleep apnoea. Critically, periods of flow limitation can occur without overt reductions in airflow (e.g. disproportionate increase in ventilatory drive vs. achieved ventilation), however, such periods are ignored by clinical scoring. Here we investigate flow limitation during so-called "stable breathing", i.e. periods of sleep without scored events, by applying our recently-validated model to estimate flow limitation from the airflow signal.

**Methods:** Flow limitation was visually-scored (N=117,871 breaths) from N=40 participants attending an overnight sleep study for suspected sleep apnoea. Scoring was aided by physiological signals (e.g. intra-oesophageal diaphragm EMG). Model flow limitation classification used features extracted from the pneumotach signal (cross-validated accuracy=92.4%). We applied this method to investigate the occurrence of flow limitation during stable breathing, defined as periods of sleep >3 min duration without scored arousals or respiratory events.

**Results:** Model predicted flow limitation frequency was strongly correlated with visual scoring ($R^2=0.84$ $p<0.001$). The median flow limitation frequency during stable breathing ranged from 8–91%, with an overall median of 59% (IQR 37%-75%). Flow limitation frequency during stable breathing was only modestly associated with the apnoea-hypopnea index ($R^2=0.12$ $p<0.05$).

**Discussion:** Flow limitation occurs surprisingly frequently during stable breathing. While some individuals achieve stable breathing with minimal flow limitation, others demonstrate substantial flow