Discussion: These data suggest that suvorexant is generally well tolerated in a more medically diverse population than studied in the clinical development program, with a safety profile that is consistent with the product label. Finally, findings should be interpreted with caution since no control group was used in the study.

P075 | The validity of a novel wearable device for estimating sleep onset

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Introduction: Accurate measurement of sleep onset in the home environment is difficult. Some procedures are invasive or expensive to administer (e.g. PSG), while other procedures are less invasive but also less accurate. THIM is a novel wearable device designed to accurately estimate sleep onset for use in the home environment. THIM administers low intensity vibrations to which the user responds with a gentle finger twitch. When finger twitch responses cease, THIM assumes the user has fallen asleep. While previous research with similar devices showed that this method of estimating sleep onset is accurate, the use of vibratory stimuli and finger twitch responses is novel. If found to accurately measure sleep onset, this device could be used to administer a brief but effective treatment for insomnia called Intensive Sleep Retraining. This study assessed the accuracy of THIM for measuring sleep onset compared to the gold-standard, polysomnography (PSG).

Method: 24 participants (12 good sleepers, 12 poor sleepers) will undergo overnight PSG recording whilst using THIM simultaneously. Participants completed sleep onset trials within a 4-hr window of opportunity starting 1 hr before their habitual bedtime. In these trials, participants attempted to fall asleep whilst responding to the vibrations emitting from THIM. Once they failed to respond to the vibratory stimuli, THIM woke them up with a high intensity alarm vibration. Participants had a short break before attempting the next trial. THIM's estimations of sleep onset was compared to PSG-defined sleep onset.

Results: Based on available data from 5 participants, finger twitch responses ceased before PSG sleep onset on a small minority of trials (22.92% of the total number of trials). During the trials where PSG-sleep onset could be determined, THIM overestimated sleep onset on average by 0.342 min, or 20.50 s. The absolute mean discrepancy was 0.946 min, or 56.77 s.

Conclusions: THIM is accurate at estimating sleep onset, more so than similar devices used in previous research. THIM may be suitable for administering ISR in the home environment, which will be investigated in future research.

P076 | Eye-blink parameters detect drowsy driving impairment

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Introduction: This study examined the accuracy of eye-blink parameters for detecting driver drowsiness that leads to 20% of fatal crashes in developed countries.

Methods: Twelve participants (6males, 6 females) undertook two sessions of 2-hr track driving in an instrumented vehicle following a normal sleep (minimum 8 hr in bed) or 32–34 hr of extended wake period in a randomized crossover design. Eye-blink parameters and out-of-lane driving events were monitored continuously using the infrared oculography (Optalert) system.

Results: Sleep deprivation impaired driving performance, with a significant rise in frequency of early drive termination and out-of-lane events rate ($p < 0.0001$ for both). Compared to normal sleep, there were significant impairments ($p < 0.0001$ for all) in eye-blink parameters; long eye closures rate, the percent of time with long eye closure for more than 10 milliseconds, inter event duration (IED), average blink duration, the ratio of maximum amplitude to velocity of eyelid closure (positive AVR) and John's Drowsiness Score (JDS, a composite score). A significant interaction of duration of drive by sleep deprivation was evident for all eye-blink parameters ($p < 0.05$), except for positive AVR, negative AVR and the IED. Apart from the IED and average blink duration, the increments of other eye-blink parameters were associated with an increased risk of out-of-lane events (standardised Odds Ratios) after sleep deprivation. These eye-blink parameters also achieved moderate accuracies (specificities less than 85% at their nearest sensitivities to 50%) for detecting drowsy driving (out-of-lane events) in the same minute.

Conclusion: Severe sleep deprivation impairs all eye-blink parameters significantly and interacts by time on task, causing progressive impairments over the course of drive. The eye-blink parameters are significantly associated with an increased risk of out-of-lane events (drowsy driving), with moderate accuracies for detecting out-of-lane events. Eyelid closure parameters are useful tools for measuring and monitoring drowsiness-related impairments while driving.