melatonin supplementation decreased body weight of nurses working night shifts for less than five years, suggestion that the use of melatonin may help to reduce excess weight when introduced in the first years of exposure to night work.

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Model-Derived Estimates of Police Officers' Sleepiness Using Actual and Predicted Sleep/Wake Behavior

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Introduction: In operational settings, managing fatigue and sustaining performance are critical to maintaining safety and productivity. Biomathematical models have been developed to predict fatigue and performance from sleep-wake histories enabling the construction of work schedules that minimize fatigue and performance impairment. Often, however, sleep-wake histories are unknown. In these cases, work schedules can be used to predict sleep-wake histories, which, in turn, can be used to predict fatigue and performance. It remains to be determined whether workers in different operations organize their sleep similarly, and whether sleep predictions generalize across operations. We assessed whether a sleep estimator developed using sleep-wake data from pilots and rail operators accurately predicts police officers' sleep-wake behavior. **Methods:** N=191 officers enrolled in the Buffalo Cardio-Metabolic Occupational Police Stress study were studied. Work schedules were obtained from payroll data and officers' sleep-work diaries. Sleep-wake behavior was measured using wrist-actigraphy and predicted using a biomathematical model (FAID Quantum). Fatigue exposure metrics included the proportion of shifts with <5h of sleep in the prior 24h (<5h sleep/24h) and <12h of sleep in the prior 48h (<12h sleep/48h). Sensitivity, specificity, and overall agreement were used to assess the validity of the predicted sleep-wake schedules. **Results:** Officers participated for 10.9 ± 3.8 days and worked 7.6 ± 2.8 shifts. Officers obtained <5h sleep/24h and <12h sleep/48h prior to 14.7% and 35.1% of shifts, respectively. The model predicted <5h sleep/24h and <12h sleep/48h prior to 3.3% and 18.7% of shifts, respectively. The model's sensitivity (79.5%), specificity (89.3%), and overall agreement with the actual sleep-wake data (86.6%) were high. **Discussion:** Officers' predicted sleep-wake behavior demonstrated high overall agreement with the officers' actual sleep-wake behavior. Sleep duration was generally overestimated, and the proportion of shifts likely worked fatigued was underestimated. It remains to be determined whether this significantly impacted the model's sleepiness predictions.

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Daytime Light Exposure affects Circadian Adaptation to a Week of Night Shifts

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Introduction: The aim of the study was to examine the influence of sleep time in the dark, and thus the timing of daytime light exposure, on circadian adaptation to a week of night shifts. It was hypothesised that night work would delay the circadian system - and the size of the delay would increase as the duration of exposure to morning and early-afternoon light (MAL) decreased. **Methods:** So far, 43 adults (21F, 22M) have been randomly assigned to one of four conditions in a laboratory-based simulated shiftwork protocol. Each condition included 7 consecutive 8-h night shifts (23:00–07:00h). The only difference between conditions was in the timing of the 7-h sleep opportunities in breaks between shifts - morning (08:30–15:30h, shortest MAL), split#1 (08:30–13:30h & 19:30–21:30h, short MAL), split#2 (08:30–10:30h & 16:30–21:30h, long MAL), and afternoon/evening (14:30–21:30h, longest MAL). Circadian phase was assessed using salivary dim light melatonin onset (DLMO) on the nights immediately before and after the week of night work. Light intensity was 75lx during night shifts, <0.03lx during sleep, <10lx during DLMO assessments, and 350lx at other times. **Results:** The DLMO data were analysed using a mixed-design ANOVA with one within-subjects factor (time: pre/post) and one between-subjects factor (condition). There was a significant interaction (F=10.6;df=3,39;*p*<.0001) - the type/size of the phase shift differed between the conditions, i.e., morning (delay=5.06±2.11h), split#1 (delay=2.58±2.46h), split#2 (delay=1.30±2.62h), and afternoon/evening (advance=0.71±2.84h). **Discussion:** These data indicate that the timing of daytime sleep, and thus the amount of exposure

XXIV International Symposium on Shiftwork & Working Time - Shiftwork2019

Keynotes

When Can You Start Trusting an Awakening Brain?

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The awakening period is often characterized by grogginess and impaired performance. These effects, referred to as *sleep inertia*, have been reported to last everything from a few minutes up up to several hours. It is at present a poor understanding of how fast one can expect an awakening person to make swift and accurate decisions. The presentation will focus of how fast the brain wakes up, and factors affecting the awakening process. The audience can expet a review of the literature, and to see data from a series of recent experimental and field studies that have determined how different cognitive functions return to normal in abrubtly awakened individauls. The results are important since on-call duty is common in the modern society, and staff is often expected to make safety critical decisions immediately upon awakening.

Health and Safety Risks Related to Specific Characteristics of Shift Work Scheduling

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It is well documented that shift work particularly when including night shifts is associated with shorter and disturbed sleep, increased fatigue, poorer work performance, and higher work-life interference. Furthermore, many studies suggest that shift workers have increased risk of cardiovascular disease, breast and prostate cancer, diabetes, and gastrointestinal disorders, although the causal relationship between night work and adverse health outcomes remains to be established. Night work can be organised in many ways e.g. as part of a rotating or permanent schedule, few or many consecutive night shifts (speed of rotation) and short or long time between shifts. The choices have consequences