

COMPARING PERFORMANCE DURING SPLIT AND CONSOLIDATED SLEEP/WAKE SCHEDULES

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Background

- Staying awake for long durations reduces the ability to perform tasks. This is worse at night when the body clock promotes sleep.
- Scheduling multiple short shifts per day may help reduce fatigue-related risks and sustain the performance during bushfires because they allow some shifts during the day, some sleep at night, and shorter durations of wakefulness.
- Our aim is to compare performance across consolidated and split schedules.

Methods

- 25 healthy participants were scheduled to one of two 10-day sleep/wake schedules in a sleep laboratory. Both schedules provided a sleep-to-wake ratio of 1:2. However, 12 participants were provided sleep and wake periods half as long as the 13 participants on a consolidated schedule. Therefore, 2 shorter sleep/wake cycles occurred in the split schedule for every 1 cycle in the consolidated schedule.
- Performance was assessed using various measures. Reported here are results from a 10-min reaction time (RT) task.

Results

- Relative to baseline performance, RT during the consolidated schedule were slower than RT during the split schedule.
- Wakefulness affected RT similarly for both schedules (Fig. 1A), but because wake durations in the split condition were shorter performance at the end of wake periods was better.
- RT on both schedules were faster during the day than at night (Fig. 1B). However, the effect of day and night did not greatly differ between schedules.

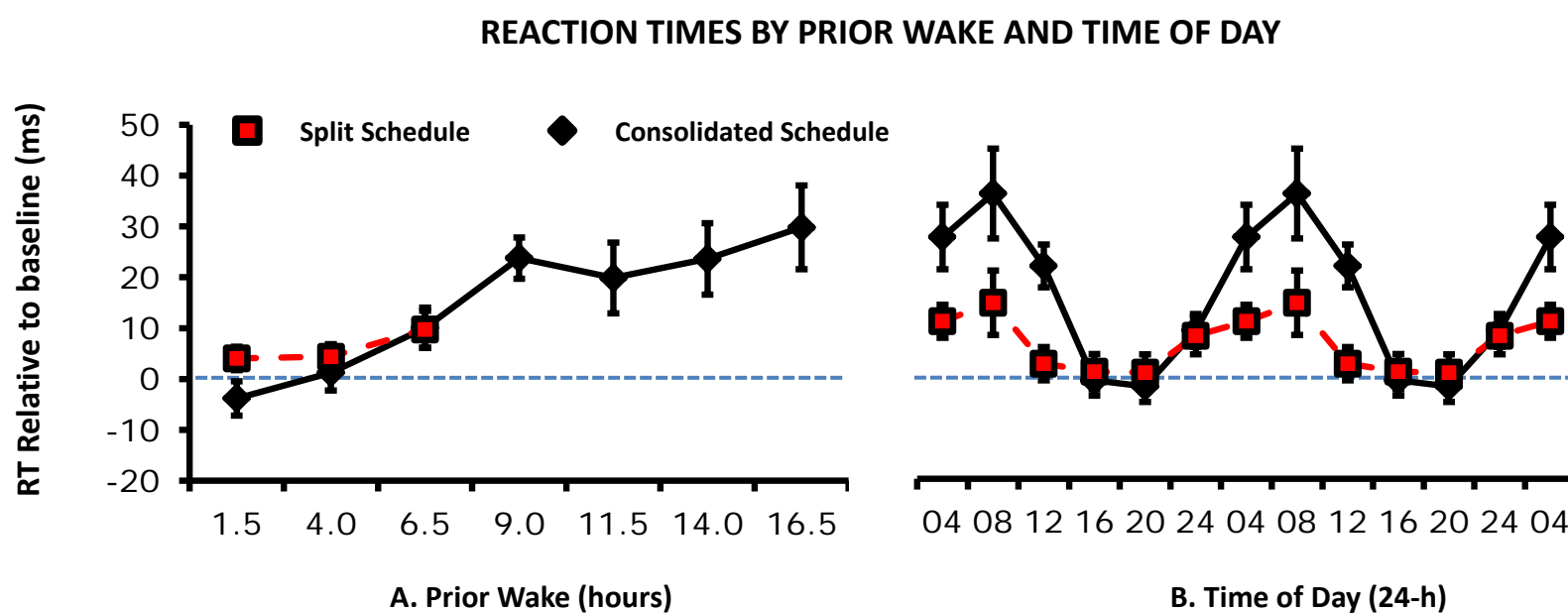


Figure 1. Mean (\pm SE) RT relative to baseline for consolidated and split schedules, by (A) length of prior wakefulness and (B) time of day. Blue dashed lines represent baseline performance. Positive values indicate RT slower than baseline performance.

Conclusion

- Initial data from this one RT task suggest that split schedules may help to maintain performance because the duration of wakefulness between sleeps is much shorter.
- Further analysis of other performance, mood, and fatigue measures will be required to make a more informed assessment regarding the benefits of split schedules.

End-User Statement "Working hours on major campaign fires present significant complexity for incident managers due to the need to balance the incident response requirements with the availability of people, skill balance, and crew safety (particularly fatigue). Scientifically-based research into the effectiveness of varying working hours models from a fatigue perspective provides incident managers with alternatives to the 12 hour shift model, should they require them." (Robyn Pearce, Director Human Services, Tasmania Fire Service)