

MONITORING & OPTIMISING SLEEP

Why is this relevant?

COVID-19 workers may be required to undertake night-time, early morning, rotating and extended duration work hours. These work demands may result in insufficient sleep and having to work during the body's circadian low point in alertness. Together, these factors may result in sleepiness and reduced alertness levels, which can have adverse effects on physical and cognitive performance and potentially raise the risk of accidents and errors. If prolonged, inadequate sleep and circadian disruption can also have a negative impact on immune function and mental health.

Core constructs/concepts

It is important to be aware of the different factors which can influence sleepiness levels. These factors include:

- **Circadian timing:** The internal circadian pacemaker regulates many behavioural and physiological processes over a ~24h rhythm, including the sleep/wake cycle. This pacemaker signals increased alertness levels during the daytime hours and a high desire for sleep during the night-time hours.
- **Sleep duration:** Most adults need between 7 to 9 hours of sleep per 24-hour period. Sleep duration restricted below this amount can result in considerable sleepiness and impact upon function during wakefulness, including impairing decision making, reaction times, ability to communicate and mood. The negative effects of sleep loss accumulate over time, worsening with each day of inadequate or disrupted sleep.
- **Time awake:** As the total time spent awake increases, so too does the propensity for sleep. Consequently, this can result in increased sleepiness levels and impaired alertness. For example, after being continuously awake for 17 hours, impairments in reaction time performance can be equivalent to having a blood alcohol concentration of 0.05%.
- **Sleep inertia:** This is the grogginess/sleepiness that can occur immediately upon awakening. Sleep inertia can impair alertness levels, resulting in adverse effects to cognitive and physical performance. The time it takes to overcome sleep inertia can last anywhere from a few minutes up to an hour. This is an important consideration if people are likely to be napping and have to begin work quickly upon waking.

These factors are all relevant and at various times are likely to influence the safety, performance and health of covid-19 workers.



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Practical recommendations

The below recommendations should be considered by both workers and their managers to optimise sleep and to monitor and improve alertness, health and wellbeing.

- Try and plan ahead and prioritise an adequate opportunity for sleep wherever possible. Individual sleep needs may differ, but most adults need between 7 to 9 hours of sleep per 24-hour period.
- Pay attention to the warning signs of fatigue and sleepiness. These include:
 - Yawning
 - Heavy eyelids
 - Very slow blinking
 - Eyes going out of focus
 - Wandering thoughts
 - Difficulty concentrating
 - Making small mistakes.
- Employers and those providing support can use validated tools to monitor staff sleepiness/fatigue levels. For instance, the Karolinska Sleepiness Scale (KSS) is a very brief (2 minutes) and well-validated tool that can be used to make people consider their acute sleepiness levels and monitor for levels of concern.
- A 20-to-30-minute nap can provide temporary relief from sleepiness, but when possible it is important to plan for a longer nap or sleep for greater recovery. Be aware of potential sleep inertia upon waking and allow time for this to dissipate before attempting safety-critical tasks.
- Caffeine can be used to boost alertness levels when fatigued, but it should be used carefully as it can also interfere with getting to sleep. High-frequency (e.g., hourly) low-dose caffeine (e.g., 30 to 40 mg – about one cup of tea or half a cup of instant coffee) is recommended. High doses of caffeine should be avoided ~6 hours before sleep.
- As much as possible, it is important to keep a regular sleep-wake routine, even on days off. Going to bed and getting up at the same time is important for keeping your sleep and circadian systems aligned.
- Aim for a single long sleep period as soon as possible after an evening or night shift. Inadequate sleep can be supplemented with an afternoon 30-minute to 2-hour nap before starting the next evening or night shift where necessary.
- Maintain a sleeping environment that is dark (e.g., use eye masks, dark-out curtains/blinds), quiet (e.g., use ear plugs) and cool (18°C to 24°C).
- Limit alcohol intake in the hours before sleep and do not use alcohol as a sleep aid.
- Where possible, it is important to try and optimise shift schedules to allow for adequate recovery sleep between shifts.

Relevant literature

Rajaratnam SM, Howard ME, Grunstein RR. Sleep loss and circadian disruption in shift work: health burden and management. *Med J Aust.* 2013; 199(8): S11-15.
Kecklund G, Axelsson J. Health consequences of shift work and insufficient sleep. *BMJ.* 2016; 355: i5210.
Rajaratnam SM, J. Arendt J. Health in a 24-h society. *Lancet.* 2001; 358(9286): 999-1005.