
Shift work disorder
American academy of sleep medicine
2026 update

SHIFT WORK *DISORDER*



SWD is a circadian misalignment that involves complaints of insomnia during the sleep period and/or excessive sleepiness during the wake period despite adequate time in bed and an absence of other sleep disorders that is directly linked to shift- work exposure that overlaps the usual time for sleep for at least 3 months , accompanied by a reduction of total sleep time.

HEALTH EFFECTS OF SHIFT WORK

- Peptic ulcers : Fourfold increased risk of duodenal ulcers
- Atherosclerosis : Increased risk for cardiovascular morbidity and mortality
- Metabolic disorders :Overall, shift work increases the risk of DM2 & obesity
- Urinary symptoms ,Testosterone decline in men , Reproductive health challenges
- Neurologic disorders
- Breast cancer (50% increased risk)

Dose dependent effects :

- Rectal cancer (60% increased risk in more than 15 years of rotating night work)
- DM2 in early chronotypes
- CAD in women
- Depression & Anxiety (new onset)

Shift workers should have regular physical examinations with attention to mentioned risks

SHIFT WORK TOLERANCE



The average prevalence of SWD estimated at 30% among night- shift workers and up to 20% among rotating shift workers depending on the definitions.

Melatonin adaptation in response to night work : Diurnal preference (early birds vs. owls), has been linked to polymorphisms of the clock gene, PERIOD3. Night workers who are carriers of the five- repeat allele of the PERIOD3 gene have higher levels of sleepiness compared to PERIOD3 homozygotes . The trait of sleep disturbance in response to situational challenges or "sleep reactivity" is a *heritable* predisposition.

<u>PREVENTION OF SWD</u> : PERIOD3 genotyping & at least *chronotyping* of workers

PERFORMANCE PREDICTION

Deactivated anterior prefrontal cortex is the only common finding among 3 states :
sleep- deprived wakefulness, NREM sleep, and sleep inertia.

sleepiness has the greatest effect on neural pathways that are used most intensively during performance of a given task .

Sleepiness induced declines in performance are not the result of a general slowing (long reaction times intermixed with normal parts). task performance of a sleepy individual can vary from impaired to normal on a moment to moment basis.

The precise degree to which performance on a particular task will be degraded is not predictable for a specific individual so the general trends of deficits can be predicted .

PERFORMANCE PREDICTION

- Sleeping less than 7 hours per *night* represents "insufficient sleep" .

- In many shift workers, both insomnia and sleepiness continue even after months or years of shift work or even after discontinuation of long- term shift work.

- Among medical personnel, an increased number of percutaneous injuries, medical and diagnostic errors, and patient death rates have been documented.

- Sleepiness tends to promote impulsivity and risk taking and impairs social interaction.

PERFORMANCE PREDICTION

Daily alertness & performance variations are directly related to physiologic range of circadian cycle :

Peak : Early evening (19.30 p.m.) then mid morning (10 a.m.)
Nadir : Early morning (5.30 a.m.) , then early afternoon (15.30 p.m.)

For sleep durations of more than approximately 4 hours per night, performance declines across days but it reaches an equilibrium level at which no further sleep debt is accumulated. For sleep durations of less than 4 hours per night , the equilibrium is not achieved, and performance continue to decline across days so :

4 hours of sleep per night can be seen as a * threshold *

Sleeping more than 8 hours per day for an extended period of time provides resilience to the effects of sleep loss and reduces recovery time

TIME ON TASK

Regulating working hours cannot provide an effective control for reducing fatigue-related errors because the circadian causes of fatigue are unavoidable, and even if we provide a good working time that provides opportunities to rest, people live complicated lives with many competing family and social obligations that reduces sleep opportunity.

During sleep deprivation, the time- on- task effect is reversed by rest breaks. Performing a different task restores performance similarly to a rest break.

The portion of the performance impairment that is due to time on task can be reversed by simple rest break , but the portion that is due to sleep loss is reversed only by recovery sleep.

TREATMENT :

- Cessation of the shift- work schedule should be the first option

- Consider circadian phase preferences (preventive)

- Educate patient's family : shift workers need of protected time for sleep (sleep priority)

- Increase exercise (not within 3 hours of the major sleep period)

- Promote healthy eating habits,not within 3 hours of bedtime. the AASM suggests either not eating or eating a snack rather than eating a full meal during the night shift .

- Move heavy workload outside circadian nadir (4 to 7 a.m.)

- Reduce substance & alcohol use

SHIFT SCHEDULE CHANGE

Reduce number of consecutive shifts (<= 3)

Reduce shift duration (< 12 h)

Use clockwise shift rotation (very low certainty of evidence)

Ensure adequate time between shifts (>11 hours)

Address commute time (longer = greater accident risk)

Move to day or evening shift (not early morning shift) :



Early morning shift workers report sleep disturbances almost as severe as night-shift workers due awakening before 5 a.m. Thus they are often on the road to work place, or on their duties ,when they are at the lowest point in circadian phase and highest point of sleep inertia , which poses serious risk for vehicle accidents during morning commutes or safety issues at work.

SHIFT WORKERS SLEEP HYGIENE

The lack of circadian adjustment in shift workers manifests as sleep disturbance during the latter half of daytime sleep , so :

1- Consider fixed sleep - wake schedule even on days off & adopt a late sleep schedule (bedtime of 3 a.m.) for night workers.

2- Increase darkness during daytime : wearing sunglasses while driving back home, use eye mask, earplugs, and light- blocking shades during daytime sleep.

3- Use of 2 sleep periods: (1) an "anchor" sleep period of 4 hours (e.g., 8 a.m. to noon) regardless of workday or day off and (2)a 3 hour period of sleep taken at irregular times.

FATIGUE COUNTERMEASURES





Light :

Consider compromise phase position : For phase delay, use bright light at least 5000 lux during first half of night shift (specially useful for day time insomnia)

Coffee :

- **prior or during the shift, not at the end of the shift time (causes day time insomnia)**
- ***pre nap* coffee is beneficial in reducing impairing effects of sleep inertia.**
- **Adenosine receptor gene polymorphisms contributing to susceptibility to sleep disturbance .**
- **Individuals can develop tolerance to the central and peripheral effects of caffeine with regular use.**

NAP …

- Sleep banking (napping as long as possible during the day before the night shift) & 2 brief naps (each, 20-30 minutes) during the night has been effective against fatigue.

- prophylactic naps, those taken before significant sleep loss, were better than naps that replace sleep that is already lost .

- Naps led to performance equal to, and sometimes greater than, baseline performance.

- A recommendation designed to avoid sleep inertia is to keep night naps, short, to prevent onset of deep sleep . inertia is a problem in first responders & on calls.

TREATMENT

- The circadian rhythms of the majority of shift workers do not adapt to shift and circadian adaptation is not a common goal of treatment or patients with SWD.

- As such the majority of the recommendations provided in 2026 guideline will focus on the management of sleepiness or insomnia symptoms, rather than on circadian adaptation .

- There is conditional recommendation with very low certainty of evidence for CBT-I in SWD.

- For rotating shift workers, circadian adaptation is not a realistic goal of treatment so they would not be expected to benefit from circadian interventions. The evidence supporting these recommendations came from studies in which individuals reached partial circadian adaptation to the night shift.

TARGETS FOR TREATMENT

1- Better sleep on the day after a night shift

2 - Better performance during the night shift

3 - Better night sleep following shift work



MEDICATIONS

Hypnotics

- Day time Sleep initiation problems :

  short- acting hypnotics (Zaleplon , Ramelteon)

- Day time Sleep maintenance problems :

  intermediate acting hypnotics (Eszopiclone , Daridorexant)

* BNZs : not indicated

Alertness enhancers

- Sleepiness during the night shift :

Caffeine tabs

Modafinil , 30 min before the shift (The best certainty of evidence among other recommendations)

MEDICATIONS

Chronobiotics :

Melatonin (0.5 to 3 mg) improves circadian adaptation through phase delays or advances, depending on the time of administration (e.g. 3 mg for better day time sleep).

The AASM suggests the use of melatonin for night sleep following shift work.

-Inappropriately timed light will counter any phase shift
-Melatonin causes performance impairmentat 5mg dose.
-Melatonin can not improve sleep when taken as a sleep aid in insomnia, not related to circadian rhythm disturbances (SWD is a circadian concern).

FATIGUE PROOFING

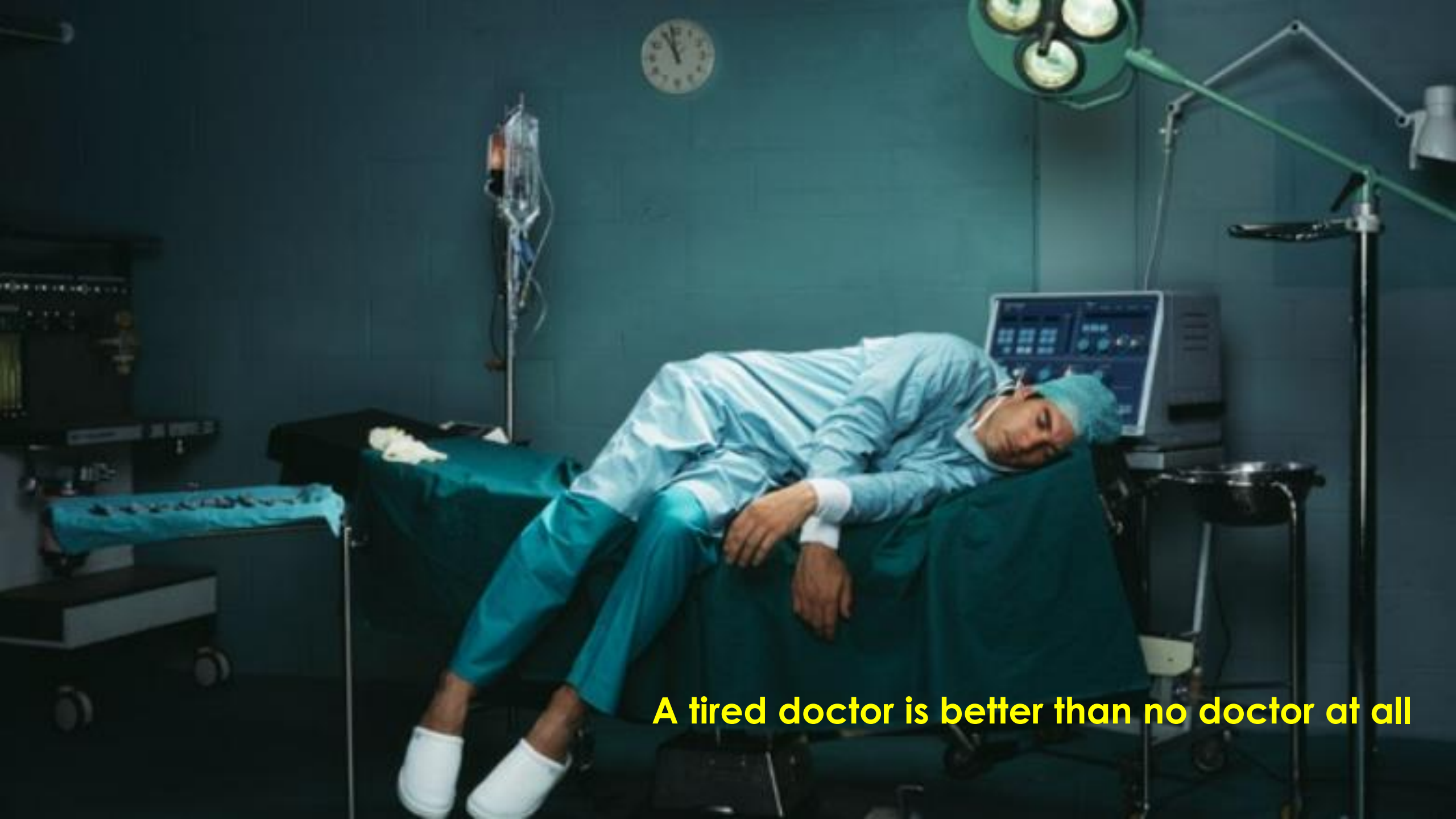
Fatigue proofing refers to strategies that ensure safety and productivity are maintained even in the face of fatigue.

The risk associated with removing some one from the workplace when fatigued might, paradoxically, increase risk, through a reduction in service availability…

- Employing expert workers :

1- human performance self regulation : Energy expenditure, or mental and physical effort, is able to be consciously increased or decreased in response to work demands.

2- Communication skills , teamwork & Call for help strategies


A tired doctor is better than no doctor at all

18th International congress of anesthesiology, critical care and pain management