



*Shift work sleep disorder (SWSD) is a circadian rhythm sleep disorder characterised by insomnia and excessive sleepiness affecting people whose work hours are scheduled during the typical sleep period. There are numerous shift work schedules, and they may be permanent, intermittent, or rotating; consequently, the manifestations of SWSD are quite variable.*

The primary symptoms of SWSD are insomnia and excessive sleepiness associated with working (and sleeping) at non-standard times. Total daily sleep time is usually shortened by several hours despite attempts to optimize the sleep environment. Sleepiness is manifest as a desire to nap, unintended dozing, impaired mental acuity, irritability, reduced performance, and accident proneness. Shift work is often combined with extended hours of duty, so fatigue can be a compounding factor.

Insomnia and wake time sleepiness are related to misalignment between the timing of the non-standard wake/sleep schedule and the endogenous circadian propensity for sleep and wake. In addition to circadian misalignment, attempted sleep at unusual times can be interrupted by noise, social obligations, and other factors. Finally, there is an inevitable degree of sleep deprivation associated with sudden transitions in sleep schedule. For example, a night worker who stays awake for 24 hours on the first night of a tour of duty is acutely sleep deprived by morning.

There have been many studies suggesting health risks associated with shift work. For example, a study led by the IARC (International Agency for Research on Cancer) showed that shift work has been associated with cancer. Other studies have reported that night workers have an increased incidence of heart disease, digestive disorders and menstrual irregularities. Because a formal diagnosis of SWSD was not typically made in these studies, it remains unclear whether the reported risks apply to the subset of shift workers who qualify for a diagnosis of SWSD or apply to all shift workers.

Experts agree that there is no such thing as an “ideal” night work schedule, but some schedules may be better than others. For example, rotating shifts every two weeks in a forward (delaying) direction was found to be easier than rotation in a backward (advancing) direction. Gradual delays (“nudging” the circadian system about an hour per day) has been shown in a laboratory setting to maintain synchrony between sleep and the endogenous circadian rhythms, but this schedule is impractical for most real world settings. Some experts have advocated short runs (1 to 2 days) of night work with time for recovery; however, in the traditional heavy industries, longer (5 to 7 day) runs remain the rule. In the end, scheduling decisions usually involve maximizing leisure time, fairness in labour relations, etc.

Many night workers take naps during their breaks, and in some industries, planned napping at work (with facilities provided) is beginning to be accepted. A nap (if possible) before starting a night shift is a logical prophylactic measure. However, naps that are too long (over 20-30 minutes) may generate sleep inertia, a groggy feeling after awakening that can

impair performance. Therefore brief naps (10 to 30 minutes) are preferred to longer naps (over 30 minutes). Also, long naps may also interfere with the main sleep bout.

In the transportation industry, safety is a major concern, and mandated hours of service rules attempt to enforce rest times.

The light-dark cycle is the most important environmental time cue for entraining circadian rhythms of most species, including humans, and bright artificial light exposure has been developed as a method to improve circadian adaptation in night workers. The timing of bright light exposure is critical for its phase shifting effects. To maximize a delay of the body clock, bright light exposure should occur in the evening or first part of the night, and bright light should be avoided in the morning.

Melatonin is a hormone secreted by the pineal gland for about 12 hours at night. Taking melatonin resets the body clock in the opposite direction from light exposure; that is, taking melatonin in the afternoon or evening may cause the clock to reset to an earlier time, while taking melatonin in the morning may cause the clock to reset to a later time. Melatonin has been shown to accelerate the adaptation of the circadian system to a night work schedule. Melatonin may benefit daytime sleep in night workers by an additional direct sleep promoting mechanism. Correct dosage of Melatonin is imperative. Medical advice and supervision is required.

Caffeine is the most widely used alerting drug in the world and has been shown to improve alertness in simulated night work. Modafinil is a non-amphetamine alerting drug originally developed for the treatment of narcolepsy and is used to treat excessive sleepiness associated with some sleep disorders. It is not recommended for long term unsupervised use.

Obtaining enough sleep during the day is a major problem for many night workers. Hypnotics given in the morning can lengthen daytime sleep; however, some studies have shown that night time sleepiness may be unaffected.

Health problems in the short term can also include cluster headaches, fatigue, stress and loss of concentration, a higher rate of absence from the job and poor sexual performance, as shown in the majority of 200 variable-shift workers in a recent study in Kuwait.

Long term consequences of disturbing natural circadian rhythms have been investigated also. A study by Knutsson et al. in 1986 found that shift workers who had worked in that method for 15 years or more were 300% more likely to develop ischemic heart disease.

Working the night shift first became associated with higher rates of cancer in 1987. This may be due to alterations in circadian rhythm: melatonin, a known tumour suppressant, is generally produced at night and late shifts may disrupt its production. Multiple studies have documented a link between night shift work and the increased incidence of breast cancer.

**DISCLAIMER: While every effort is made to ensure medical accuracy, this paper should not be used to diagnose or treat a sleep disorder. In all cases the advice of a properly qualified medical practitioner should be sought.**

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