SHIFT WORK – back to basics
Sleep debt is the downside of night shifts – OCSA looks at how to keep a healthy balance

Technology has made it possible to do many activities at any time of the day or night - opening up the job market for new shift workers. Some workers actually prefer non-day work for better pay, more available time during the day for child care, more daylight hours for recreation, and more time to attend school. Usually, however, workers are not given a choice. They do it either because it is required of the job, or no other job is available.

Shift work is defined as work outside day hours, Monday to Friday. It includes weekend work, and jobs which start substantially before 7 am and finish at 7 p.m. or later” (Wallace).

Shift workers might work in the evening, in the middle of the night, overtime or extra-long workdays. They may also work regular days at one time or another. Many shift workers “rotate” around the clock, which involves changing work times from day to evening, or day to night. This might happen at different times of the week or at different times of the month.

Studies in the UK have found that; compared with day workers, shift workers:
- suffer 2 to 5 times the rate of stomach disorders;
- are 40% more likely to suffer from cardiovascular disease;
- suffer from peptic ulcers at an earlier age;
- suffer more from anxiety and depression;
- are more likely to die younger.

Shift work and Circadian Rhythms
Humans are by nature diurnal (day orientated) as opposed to nocturnal beings. Our physiological functions are geared towards daytime activity and nighttime rest. Research has shown that our physiological functions fluctuate in cycles, or rhythms, which are regulated by an internal biological clock in the brain.

Studies have shown that the main physiological functions such as core body temperature, hormone production, heart rate, blood pressure, gastric activity, and the sleep/wake cycle, all have cycles or rhythms of approximately 25 hours. These cycles are known as circadian rhythms (from the Latin 'circa' = about, and 'dia' = a day).

Over consecutive night shifts, this loss of sleep time during the day, or ‘sleep debt’, accumulates, so that by the 5th night a person could be 8 to 10 hours ‘in debt’. This can have a significant impact on cognitive function and a person’s general state of health.

How quickly our circadian rhythms adjust to a new sleep/wake cycle depends on internal factors such as age, gender, physical health and your chronotype (whether you are a Morning Lark or a Night Owl). External factors such as the shift pattern and workload, and family and social circumstances also play a part.

If a person rotates onto another shift pattern, before the circadian rhythms have had time to adjust to one sleep/wake cycle, it may result in a perpetual state of internal desynchronisation, where we never fully adjust to the disruption of sleep/wake cycles.

Health and safety effects of shift work
In the short term, working shifts can cause sleep disturbances, fatigue, stress, irritability, shift-lag syndrome, shift work sleep disorder (SWSD), psychosomatic troubles, difficulties in family and social contacts and errors and accidents.

In the long term, there is an increased risk of gastrointestinal, cardiovascular and psychoneurotic diseases, and women shift workers can experience adverse effects on their hormonal and reproductive functions and family roles.
Shift Lag
A condition many workers suffer from when working between 10:00 p.m. and 6:00 a.m., due to rotating schedules and non-conventional hours. It usually presents in the form of:

- **Mental symptoms**: increased irritability, becoming overly emotional, forgetfulness
- **Physical symptoms**: gastro-intestinal problems attributed to shift workers not eating properly and dehydration which leads to headaches, dry skin, nasal irritation, increased susceptibility to colds, coughs, sore throats and flu.

Consequences:

- Increase in accidents, work-related errors, sick leave, irritability and mood problems.

- Workers should receive reasonable notice to perform shift work well in advance
- Arrangements should be considered to accommodate the special needs of workers such as pregnant and breast-feeding workers, workers with family responsibilities, older workers, disabled workers or workers with health problems.

Reducing the impact of shift work

- Ensure compliance with relevant legislation.
- Involve workers in planning of shift work schedules.
- Consider making shift work voluntary instead of compulsory

The Code of Good Practice on the Arrangement of Working Time recommends that:

- Overtime should be avoided, especially in occupations involving special hazards or heavy physical or mental strain.
- The changeover from one shift to another during the working day should include a brief period of overlap of the two crews in order to pass on any information that is needed by the subsequent crew.
- If appropriate and legal, workers whose skills are interchangeable should be allowed to exchange a shift with another worker.
- The shift schedule should be displayed or distributed for easy access by all workers, and should be presented in a readily understandable form.
Improve shift work schedules

- Avoid permanent (fixed or non-rotating) night shift.
- Keep consecutive night shifts to a minimum. 2-4 consecutive nights shifts followed by a couple of days off prevents significant disturbances to circadian rhythms and limits sleep.
- Avoid quick shift changes.
  - Short breaks ≤ 7-10 hours before rotating to a new shift makes it difficult to get enough rest before going back to work. Breaks of 24 hours are recommended.
- Plan some free weekends.
  - If a seven-days-a-week schedule is required, allow one or two full weekends off each month. This provides opportunity for contact with friends and family.
- Avoid several days of work followed by four to seven rest days.
  - Working several days in a row followed by several days off contributes to the development of fatigue.
  - A long work spell should be used only when there is no other choice, such as when long travel distances are required to do the work.
- Keep long work shifts and overtime to a minimum.
- Consider different lengths for shifts. People who do heavy manual work should work shorter shifts.
- Examine start-end times.
  - “Flexitime,” can be useful for those with child care needs or long commutes. Consider moving shift start-end times away from rush hour. Morning shifts should not start too early (5 to 6 a.m.) because night sleep is often cut short before an early shift.
- Keep the schedule regular and predictable.
- Examine rest breaks.

Coping strategies for shift workers

Try to get enough good sleep - a minimum of 6 hours of sleep each day. When switching back to days after the night shift, it is best to get most of your sleep the following night.

Protect sleep - by blocking out disturbing noise, adhering to sleep routines and avoiding heavy meals and alcohol before going to bed.

Exercise - maintaining physical fitness helps to resist stress and illness. Early morning exercise is good for day shift, afternoon exercise is good for evening shift, and early evening exercise is good for night shift.

Diet - avoid fatty and refined foods with a high sugar content

Caffeine, alcohol and other drugs - caffeine in small doses i.e. 2-3 cups taken early in a shift may increase alertness during the shift. Generally, alcohol and other drugs such as hypnotics, tranquillizers, melatonin (sometimes found in products sold in health food stores), and stimulants, should be avoided.

References

1. Plain Language about Shiftwork, U.S. Department of Health and Human Services, CDC, NIOSH
5. Shift related sleep problems vary according to work schedule, Journal of Occupational and Environmental Medicine, 2013, Vol 70(4), pg 238-245