

Preventing Psychosocial Risk in Rotating Shift Workers: The Role of the Occupational Health Nurse

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Abstract

Continuous production in the electronics industry relies heavily on rotating and night shift schedules. Although essential to keep assembly lines running around the clock, these schedules are a recognised occupational hazard with measurable consequences for worker health. This mini review synthesises recent evidence on the health impact of rotating shift work and on the preventive role of the occupational health nurse in this setting, with attention to psychosocial risk. Rotating and night work desynchronise the endogenous circadian clock from the light–dark and social environment, producing sleep restriction, fragmented sleep and social jet lag. Through these pathways, shift work is consistently associated with depressed mood, anxiety, cognitive impairment, burnout and reduced quality of life, and with cardiovascular disease, metabolic dysfunction and an elevated cancer risk that led international agencies to classify circadian-disrupting shift work as a probable carcinogen. At organisational level, the same exposures raise accident rates, absenteeism, presenteeism and turnover. Within a psychosocial risk framework, the occupational health nurse contributes across the full cycle of prevention: health surveillance, structured screening with validated instruments, individual counselling on sleep and coping, health education, referral, and collaboration with management on schedule design and psychosocial management. The strongest current evidence favours combining organisational measures, such as forward-rotating rosters, limits on consecutive night shifts and controlled workplace light, with individual strategies including sleep education, relaxation and physical activity, tailored to the worker. Electronics-specific data remain scarce, which is itself a priority for future research.

Keywords: Occupational health nursing; Shift work; Circadian disruption; Psychosocial risk; Workplace mental health; Night work

Introduction

Roughly a quarter of the workforce is engaged in some form of shift work, and the proportion is higher in sectors that operate continuously [1]. The electronics industry is a clear example, where the cost of interrupting production and the demand for output push firms toward rotating and night schedules that keep assembly lines active twenty-four hours a day, seven days a week. These arrangements are lawful and, from a production standpoint, efficient, but they place workers under a distinctive combination of biological and psychosocial strain.

Over the last decade, shift work has moved from being treated as a scheduling inconvenience to being recognised as a genuine occupational health hazard. The mechanism is the misalignment between the body's internal clock and the external demands placed on it, which affects sleep, mood, metabolism and long-term disease risk [2]. Alongside these physiological effects, psychosocial risk in the workplace has been rising:

recent European survey data confirm that work-related stress, tight deadlines and demanding interpersonal situations remain among the most frequently reported hazards in enterprises [19]. The occupational health nurse occupies a strategic position in this landscape. Working within a multidisciplinary team and in close, regular contact with workers, the nurse is well placed to detect early signs of strain, deliver preventive interventions and advocate for healthier work organisation. This mini review brings together evidence from the last five years on the health consequences of rotating shift work, on the psychosocial risk framework that structures its assessment, and on the preventive activities of the occupational health nurse, with particular reference to the industrial and electronics setting.

Shift work and circadian disruption

The central mechanism linking shift work to ill health is circadian disruption. Human physiology is organised around an endogenous clock that anticipates the day–night cycle and co-

ordinates sleep, hormone release, metabolism and cognition. When work requires activity at night and sleep during the day, this clock falls out of step with both the light–dark cycle and the worker's social environment, a mismatch commonly described as social jet lag [2].

Rotating schedules are particularly demanding because the direction and pace of rotation rarely allow full circadian adaptation before the next change. The practical result is chronic sleep restriction and fragmented, non-restorative daytime sleep, which accumulate as a persistent sleep debt [3]. Because sleep is the pathway through which many downstream effects operate, disturbed sleep is both an early marker of poor tolerance to shift work and a target for intervention. Controlled adjustments to light exposure around the shift, for instance, can partially realign circadian timing and improve alertness, fatigue and mood [4].

Health consequences of rotating shift work

The mental health consequences of shift work are now well documented. Disturbed sleep underlies a broader pattern that includes depressed mood, anxiety, impaired concentration, reduced quality of life, higher rates of substance use and, in the most affected workers, suicidal ideation [3]. These effects are amplified where the psychosocial environment is unfavourable, combining high psychological demand, low autonomy, weak social support and job insecurity, conditions that predispose to burnout, understood as emotional exhaustion, depersonalisation and a reduced sense of accomplishment [19].

The physical health burden is equally substantial. Umbrella and systematic reviews link shift work and circadian misalignment to cardiovascular disease, with converging epidemiological and mechanistic evidence [3,5,6]. Related pathways include metabolic syndrome, impaired glucose regulation, gastrointestinal dysfunction and altered immune function. The oncological dimension is also relevant: circadian-disrupting night shift work has been classified as a probable human carcinogen, with the strongest associations for breast, prostate and colorectal cancer and emerging evidence for others [7-9].

Beyond the individual, shift work has organisational costs. Fatigue and reduced alertness increase the risk of accidents and errors, and the associated strain drives absenteeism, presenteeism and staff turnover, all of which affect productivity and the quality of work [12]. Interpersonal life suffers too, as the mismatch between work hours and family or social time reduces participation in shared activities and can foster isolation, which in turn feeds back into anxiety and low mood.

It is worth noting that much of this evidence comes from healthcare and transport workers, populations in which shift work has been studied most intensively. The underlying mechanisms and psychosocial dynamics generalise well to industrial contexts, but data specific to electronics manufacturing remain limited, a gap this review returns to in its conclusion.

Psychosocial risk in the shift work context

Psychosocial risk provides the conceptual frame for assessing and acting on these exposures. Work-related psychosocial factors are commonly grouped into the nature, content and load of the work; its organisation and timing, which includes shift and night work; the socio-relational context, covering social support, conflict and leadership style; and the interface be-

tween work and personal, family and social life [20]. These factors interact with one another and with biological, chemical and physical hazards, and they become genuine risks when the worker perceives the demands as exceeding their resources and outside their control, particularly where social support is lacking.

Structured assessment is essential to move from perception to action. Validated questionnaires such as the Copenhagen Psychosocial Questionnaire allow the most critical dimensions of work organisation to be identified at collective and group level, typically using a traffic-light interpretation that flags favourable, intermediate and high-risk situations [20]. At the level of policy, current international guidance stresses that psychosocial risk is best addressed by acting on working conditions themselves rather than relying only on individual coping, and that organisational interventions should be planned, participatory and sustained [18].

The role of the occupational health nurse

Within this framework, the occupational health nurse contributes across the full cycle of prevention. The foundation is health surveillance, delivered through admission, periodic and occasional examinations, with particular attention to sleep, mood and fatigue in shift workers [1]. These encounters allow early detection of strain before it consolidates into disorder, and they are strengthened by the structured use of validated screening instruments to standardise assessment and track change over time.

At the individual level, the nurse offers a confidential space for active listening and the expression of emotion, counsels workers on sleep hygiene and coping strategies, supports self-care, and refers to psychology, occupational medicine or other services when indicated. The recent literature on worker mental health confirms that such supportive and educational activities, embedded in the workplace, are valued by workers and can reduce psychological distress [10]. The nurse also has a central part in reintegration, accompanying workers who return after mental health-related absence.

The role is not limited to individual care. The nurse collaborates with management on the organisation of work, including schedule design and the broader management of psychosocial factors, and leads health education and awareness activities on sleep, stress and burnout prevention. Rigorous, standardised documentation and the use of activity indicators underpin all of this, ensuring continuity of care, supporting interdisciplinary communication and demonstrating the contribution of nursing to organisational outcomes such as reduced absenteeism and lower accident rates [12].

Evidence-based interventions

Current evidence points clearly toward combining organisational and individual measures rather than relying on either alone. Organisational interventions act on the exposure itself and are consistently prioritised in international guidance [18].

In shift work, these include roster design that favours forward-rotating schedules, limits on consecutive night shifts, adequate rest between duty periods and, where feasible, scheduling that accounts for workers' chronotypes, together with controlled modulation of light and temperature in the workplace and provision for strategic napping [15-17].

Individual-level strategies complement these structural changes. Sleep education and sleep hygiene, cognitive-behavioural approaches, relaxation and stress-management techniques, physical activity and attention to meal timing all have supporting evidence [11,14]. Systematic reviews of nursing populations report meaningful gains from targeted measures, including improved sleep quality with optimised scheduling, reduced fatigue with structured napping, and moderate benefits from light therapy, relaxation and physical activity [13].

Two caveats matter for practice. First, no single measure suits everyone; the most effective approach is a flexible, personalised combination adapted to the shift pattern, the individual and the constraints of the workplace [14, 21]. Second, individual strategies should not substitute for organisational change, since interventions that place the whole burden of adaptation on the worker tend to underperform those that also improve working conditions [18]. The occupational health nurse is well positioned to bridge these two levels, delivering individual support while advocating, on the basis of surveillance data, for healthier work organisation.

Conclusion

Rotating and night shift work in the electronics industry is a significant but modifiable occupational health challenge. Through circadian disruption and disturbed sleep, it affects mental health, cardiometabolic and oncological risk, interpersonal life and, at organisational level, safety and productivity, with psychosocial risk providing the frame that connects these effects to the way work is organised. The occupational health nurse is a strategic agent of prevention in this context, combining health surveillance, structured screening, individual counselling, health education and referral with collaboration on work organisation. The evidence supports integrated, personalised interventions that pair organisational measures such as forward-rotating rosters and controlled light with individual strategies such as sleep education and relaxation. Strengthening surveillance, standardised records and activity indicators, and investing in the continuing education of occupational health teams, will consolidate this preventive role. Finally, the relative scarcity of evidence drawn specifically from electronics manufacturing, as opposed to healthcare, is a clear priority for future research.

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