CUPE's Literature Review of Shift Rotations and Patient Care

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Introduction

There is a large body of research examining the health effects of shift work on workers. Extensive research has documented how working rotating shifts on a 24-hour basis can have numerous health effects on workers, primarily because the circadian rhythms in the body are disrupted. The circadian rhythms act like a biological clock and respond to natural cues such as light and darkness to regulate the heart rate and body temperature throughout a 24-hour day. During the day, for example, body temperature rises and at night, it decreases.

The disruption of the body's natural circadian rhythms by shift work can result in changed sleep patterns, gastrointestinal disorders, chronic fatigue, weakened concentration or alertness, increased stress, pressures on one's family and social life, cardiovascular disease (Shields, 2002; Costa, 1996; Glazner, 1992; Williams, 2008). There are recent studies showing an increased rate of breast cancer among women who work night shifts (Davis, 2001; Schernhammer, 2001).

Working shift work is, unfortunately, inevitable in industries that require the workplace be staffed 24 hours a day. In 2005, approximately 28% of employed Canadians worked shift work or irregular schedules (Williams, 2008). Health care is one such industry that requires staffing around the clock.

The research reviewed indicates that the majority of nursing staff who participated in studies believe that patient care and continuity of care improve with 12-hour shifts.

Much of the literature on shift work focuses on the negative impact of working shifts and strategies to minimize the impact (OHCOW, 2005; Kogi, 1996). Many publications and articles recommend that shift workers develop good eating habits, strategies for better sleep, and learn how to maintain activities with family and friends. Articles also make recommendations on how to best structure shift work (e.g., moving shifts forward from night to day to evening, ensuring a minimum of two days break between shift changes, more frequent breaks during a shift, etc.). Kogi (1996) recommends that any changes to shift schedules be developed in a joint planning process that identifies organizational needs, worker preferences and feasible options.

Research specifically focusing on the impact of 8 hour versus 12 hour shifts is not as abundant. Much of the research has focused on male-dominated workplaces, such as power plant workers, or police. As well, there have been several studies examining the

impact of various lengths of shift schedules in health care and the studies tend to focus on registered nurses and not other health care staff. This literature review summarizes the key findings of the research on 8-hour versus 12-hour shifts.

Workers' preference for 12-hour shifts

Both anecdotal evidence and numerous surveys of workers indicate that workers, in health care and other workplaces, prefer 12-hour shifts. In a study of health care workers in an intensive care unit of an Australian hospital (Dwyer, 2007), 92% of staff supported the 12-hour shift after the trial period and 58% felt that the longer shift had a positive impact on their physical and psychological well-being. Participants felt that the 12-hour shift gave them greater satisfaction at work, more flexibility in their personal life and increased time for family and social activities. They also reported that they were less tired at work and less likely to take a sick day.

Participants also strongly agreed that 12-hour rostering was a good recruitment (67%) and retention (75%) strategy.

A study of 54 nurses at an NHS hospital in England (McGettrick, 2006) reported that nurses saw many positive impacts of 12-hour shifts. The respondents felt there was improved patient care, more job satisfaction, more off duty time, and improved family life. Staff found that 12-hour shifts allowed for more flexibility, more time at home and enhanced family relationships.

In a study of employees at a power station (Mitchell, 2000) workers felt that their domestic and social life improved with the move to a 12-hour shift and that their physical health, sleeping patterns and mood also improved.

Another study from England (Lea, 2003) evaluated the introduction of a trial shift schedule of two 12-hour shifts followed by two six-and-a-quarter hour shifts in a hospital in Nottingham. The schedule was developed to comply with the European Working Time Directive.

In terms of the effect on their personal life and health, nursing staff indicated the following benefits from the new shift system:

- Increased leisure time
- No long stretches of six or more consecutive shifts
- Increased job satisfaction
- More time to spend with family
- More time to unwind after a late finish
- More study time for personal or work-related courses
- Less stress due to better time management
- Less need to stay late after shift
- Improved or no effect on childcare arrangements

The length of shift and its impact on fatigue, sleep disruptions and workplace errors

Although there are some studies indicating that workers experience more fatigue on a 12-hour shift than on an 8-hour shift – especially during the end of the long shift – there are other studies that reached the opposite conclusion.

An evaluation of 8- and 12-hour shifts at a power station (Mitchell, 2000) found that there was an increase in error rates at the end of a 12-hour shift. This was attributed to increased fatigue with longer work hours. The conclusion of the authors, however, was that the employer should explore ways of reducing risk of error towards the end of a 12-hour shift and ensure that more critical tasks be scheduled at the beginning of the shift.

Research published in the *Scandinavian Journal of Work Environment Health* (Axelsson, 1998) concluded that the difference in sleepiness between 8- and 12-hour shifts was related to the differences in *length of sleep for the morning shift*, and to *differences in physical effort for the night shift*, rather than to shift duration.

In the Australian hospital study, (Dwyer, 2007) the majority of health staff reported that they slept 'quite well' or 'moderately well' after moving to a 12-hour shift. The *end time* of the shift was a greater factor contributing to fatigue than the *length of the shift*. One participant from the study commented, "After an 8-hour shift that finishes at 23:00 hours, I would feel quite lethargic and since there are no 12-hour shifts finishing then, I feel much better now."

Having fewer nurses involved with the care of a patient on a single day meant improved communication between nurses and health care professionals, which reduced the margin for communication breakdown and error.

In a study of 738 nurses in Israel, (Hanna, 2008) the researchers found that nurses who only worked day shifts complained significantly more than shift nurses about health problems and sleep disturbances. Although this appears to contradict existing research on shift work (Glazner, 1992; Costa, 1996), the researchers were able to determine that gender, age and weight were significant factors that impact the well-being of nurses. The nurses who only worked day shifts tended to be older on average than the nurses who worked rotating shifts.

The research also found lower absenteeism rates among the shift work nurses than among the daytime nurses, which the researchers felt could also be explained by differences in age.

An article written by Shullanberger (2000) summarizes his comprehensive literature review of nursing staff issues. Shullanberger refers to a study by Gillespie and Curzio (1996) which found that nurses working 12-hour shifts reported less fatigue than those who worked 8-hour shifts. In interviews, 80% of respondents who

worked 8-hour shifts believed tiredness was a problem, compared with 20% of 12-hour shift nurses.

The results of the Nottingham evaluation (Lea, 2003) found that sporadic sickness during the trial year of longer shifts was almost half that of the previous years. The evaluation also showed fewer sharps and drug errors during the trial year compared to the previous year.

Fatigue may also be the result of shift workers cutting back on sleep to have more work-life balance. Williams (2008) notes that shift workers are more likely to cut back on sleep to have more time for other tasks than regular daytime workers (70% vs. 50%).

In the evaluation of the move to 12-hour shifts from 8-hour shifts in an Australian hospital (Dwyer, 2007), the majority (75%) of participants felt that the 12-hour shift contributed to better continuity of patient care.

The impact of 12-hour shifts on patient care

The research reviewed indicates that the majority of nursing staff who participated in studies believe that patient care and continuity of care improve with 12-hour shifts.

In the evaluation of the move to 12-hour shifts from 8-hour shifts in an Australian hospital (Dwyer, 2007), the majority (75%) of participants felt that the 12-hour shift contributed to better continuity of patient care. Having fewer nurses involved with the care of a patient on a single day meant improved communication between nurses and health care professionals, which reduced the margin for communication breakdown and error.

In another study published in the *Journal of Nursing Management*, (Richardson, 2007) two focus groups of nursing staff felt that the 12-hour shift made planning and prioritizing patient care easier. The authors believe this may be related to the 'pacing effect' which results in staff feeling less pressured to complete assigned responsibilities in a 12-hour time frame. Staff feel rushed on shorter shifts, especially on the morning shift, and the longer period of 12 hours enables staff to obtain a better knowledge of the patient.

McGettrick's study (2006) also found that nursing staff overwhelmingly agreed that patient care improved under the 12-hour shift rotation because staff has more time to plan care and spend time with both the patient and the patient's family.

In Shullanberger's summary of Gillespie and Curzio's research, he noted that the researchers found that there was more complete documentation from the nurses who worked 12-hour shifts than from those who worked 8-hour shifts. In terms of the impact on patient care, the same study found that patients cared for by 12-hour shift nurses were more likely to know their nurse's name than patients cared for by 8-hour shift nurses.

Lea and Bloodworth (2003) also report improved patient care with 12 hour shifts. The final evaluation of the year-long trial concluded that the new shift system enhanced patient care and improved the health and wellbeing of nursing staff. All ward staff felt that the new system provided for continuity of care and gave them the chance to build a therapeutic relationship between the nurse and the patients during the day and a longer period of time to monitor patients.

The only study that raised concerns about risk to patient safety was one examining excessive working hours in the United States (Trinkoff, 2006). This study of 2,273 Registered Nurses found that more than a quarter of nurses typically worked 12 or more hours per day, and that almost one-quarter of nurses with more than one job worked 50 or more hours per week. Many nurses worked in hospitals with mandatory overtime policies which contributed to the excessive work hours. The authors state that the average hours worked by nurses exceeds the recommendations of the Institute of Medicine and that this raises concerns about fatigue and health risks to nurses as well as the safety of patients.

Conclusion

The research on the health impacts of shift work is vast and overwhelmingly conclusive that shift work has a negative effect on workers' health and social/family lives.

There is also strong concurrence within the body of research that night shift work is particularly more harmful than day shifts. It is at night when the body's circadian rhythms are disrupted, leading to fatigue from different sleep patterns, gastrointestinal disorders and interference in the regulation of hormones for women.

McGettrick's study (2006) also found that nursing staff overwhelmingly agreed that patient care improved under the 12-hour shift rotation because staff has more time to plan care and spend time with both the patient and the patient's family.

The research comparing the differences between 8-hour and 12-hour shifts, however, is not conclusive. There are some studies showing that fatigue is greater and worker efficiency reduced on longer shifts but the majority of studies cited in this literature review indicate that 12-hour shifts have better results than 8-hour shifts. The numerous studies of nurses in several different countries that went from 8-hour to 12-hour shifts conclude that the longer shift improved workers' physical and psychological wellbeing, did not cause greater fatigue or workplace errors, and improved the continuity of patient care.

These results may appear to be counter intuitive but one of the key factors to explain this may be work-life balance. Williams (2008) found that the main reasons for dissatisfaction with work-life balance for all full-time workers – regardless of schedule – was not enough time for family and too much time spent on the job. The 12-hour shift schedule gives

workers more time off which is frequently identified by nurses in the studies as one of the benefits of moving to 12-hour shifts.

The specific conditions of every workplace have to be considered when assessing the relative benefits of 8-hour or 12-hour shifts. As Kogi (1996) emphasized, it is important that any changes to shift schedules be done with the full participation of the workers. Worker preferences are an important factor to take into consideration when creating shift schedules because job satisfaction ultimately impacts productivity at work.

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