Approximately 15 per cent of the Ontario working population, or 834,000 people, work a regular night or rotating shift. Night work is especially disruptive to the body’s circadian rhythm, which governs bodily processes in a 24-hour cycle.

Shiftwork involving circadian disruption is a probable cause of breast cancer, which is believed to manifest through several pathways, including sleep disruption, stress activation, lifestyle disturbances and reduced sun exposure (Figure 1). Shiftwork has also been associated with increased risk of sleep disorders and other health effects, such as injury, gastrointestinal disorders, cardiovascular disease and depression.

Interventions that address these pathways to reduce shiftwork’s health impacts have been evaluated in workers. Studies have mostly reported on health-related intermediate measures instead of the health outcomes themselves (e.g., cancer). However, high-quality research is limited. The strongest evidence exists for scheduling changes, with relatively less support for controlled light exposure, behavioural strategies, and prescription or natural health products.

The goal of schedule changes is to reduce the impact of shiftwork on circadian rhythms by varying the time of day an employee is required to be
at work. Flexible work schedules that allow workers to have some input on their schedules resulted in workers reporting improved general health, work-life balance, work performance and motivation, as well as less stress, absenteeism and staff turnover. Switching from night-afternoon-morning to morning-afternoon-night shift rotation with faster rotation between shifts (e.g., three days versus two weeks) has been found to enhance sleep and improve blood pressure, triglyceride and glucose levels.

Interventions that control light exposure aim to maintain normal internal levels of melatonin (a hormone that is suppressed by exposure to light at night) and vitamin D (produced by sunlight exposure). Normal levels of melatonin and vitamin D are believed to reduce the risk of cancer. Controlled light exposure had positive effects on workers’ melatonin levels, but mixed findings for sleep quality and quantity. The combined use of controlled light exposure and glasses or goggles to block out bright light helped the body adapt and was more effective than either intervention type alone.

Adopting workplace-based strategies to promote healthy behaviours have been assessed in few studies and their long-term effects are unclear. Based on these findings, physical training and lifestyle changes resulted in improvements in strength, lung capacity, sleep length, weight and blood pressure. Workers also reported better quality of life in workplaces where a scheduled rest period was implemented.

Melatonin supplements are widely available as a natural health product. It enhanced sleep length among shift workers in some studies, but had limited effects on helping workers adapt to long-term night work. Stimulants (e.g., caffeine, amphetamines) and hypnotics (e.g., zopiclone, nitrazepam) were found to pose health risks to workers and public safety.

In summary, there are multiple ways that the adverse health effects of shiftwork can be reduced. A combination of approaches can be used simultaneously, and preventive approaches may be unique to each industry or workplace. Additional high-quality studies in real-life workplaces are needed to draw conclusions about what strategies are most effective.

- Shiftwork is common in Ontario workers.
- Shiftwork is a probable cause of breast cancer and it is linked to many other health conditions.
- There is strong evidence that schedule changes are an effective workplace-based intervention for reducing the harmful health effects of shiftwork.
References

National Day of Mourning
Each year on April 28, Canadians honour the thousands of workers who have been killed, injured or suffered illnesses as a result of occupational incidents and exposures. Respect is also paid to the families and friends who have been affected by these tragedies. The day serves as a reminder that workplace fatalities, injuries and illnesses are preventable.

Citation: Material appearing in this Cancer Fact may be reproduced or copied without permission. The following citation must be used:

To receive Ontario Cancer Facts by email, go to http://www.cancercare.on.ca/newsletter/One.aspx?objectId=100303&contextId=668&action=subscribe, provide email address and check the box for the ‘Ontario Cancer Facts’ Newsletter box.

This Ontario Cancer Fact was prepared by staff in Prevention and Cancer Control.