Shift Work: An overview of health effects and potential interventions

Paul A Demers, Ph.D.
Occupational Cancer Research Centre
Cancer Care Ontario
Toronto, Canada
Shift Work in Canada

- Regular Night or Rotating Shift: 2%
- Regular Evening, Split Shift, On Call or Irregular Schedule: 13%
- Regular Day: 19%
- Other/Don't know: 66%

Number of Male and Female Workers in Top “Shift Work” Industries

Cancer in humans
• There is limited evidence in humans for the carcinogenicity of shift work that involves night work.

Cancer in experimental animals
• There is sufficient evidence in experimental animals for the carcinogenicity of light during the daily dark period (biological night).

Overall evaluation
• Shift work that involves circadian disruption is probably carcinogenic to humans (Group 2A).

Night Shift Nursing and Breast Cancer

• 5 studies of nurses (3 were used by IARC)
  – 2 American and 3 Nordic studies
  – All five found excesses among long-term nurses, generally after 20-30 years
Other shift workers and cancer sites

- Studies of other night shift workers and breast cancer had mixed results
- Some positive studies for other cancer sites, including prostate, but too few studies to draw conclusions
- 9 cohort studies of flight crew initiated because of concern over cosmic radiation
How does Shiftwork Cause Cancer?

Bernardino Ramazzini (1633-1714)

Author of the first comprehensive occupational medicine text in 1700.

In 1717 published *The Health of Princes*

“The inversion of sleep with wakefullness, much in vogue in the courts of princes, is little conducive to maintaining health”
Established Effects of Work at Night

• Fatigue
• Sickness absences
• Increased risk of injury
  – A recent Canadian study found 14% of injuries in women & 8% in men attributable to shiftwork*

Suspected Effects of Work at Night

- Cardiovascular disease
  - Heart attacks, stroke, coronary events
- Gastrointestinal disorders
- Diabetes?
- Reproductive problems?
  - Pre-term delivery, miscarriage, reduced birth weight, irregular menstruation
OCRC/IWH Shift Work Stakeholder Survey

• Web-based survey conducted in fall 2011
• 517 respondents
  – 67% workers; 15% managers
  – 36% nurses (many were occupational health nurses)
  – 15% correctional officers, firefighters, paramedics, or police
  – 9% other health care workers (i.e. non-nurses)
  – 6% health and safety specialists
• 66% women
If you think shiftwork is a health and safety issue among people in your industry/union/group, what are your concerns?

*Categorized from open-ended responses*
Have any attempts been made to change shift patterns or in other ways to reduce the health impacts of shiftwork in your workplace?

* 296 provided at least one response
Potential interventions

• Schedule changes
  – Direction and speed of rotating shifts
  – Lengths of shifts
  – Control over scheduling

• Controlled exposure to light and dark
  – Changes in lighting during nights and days off work
  – Use of goggles or glasses
Health Promotion Interventions

- Stimulating, varied night shift environment in terms of work tasks, social interaction, and physical activity
- Sleep hygiene advice, family counseling
- Educating management about basic circadian principles
- Naps
Drugs to promote sleep, wakefulness, or adaptation of the circadian rhythm to shift work

• Exogenous melatonin
  – Improved sleep length in some studies
  – May facilitate adaptation to long-term night work
  – More research needed

• Stimulants (e.g. caffeine, amphetamines) and hypnotics (e.g. zopiclone, nitrazepam)
  – May have short term effects
  – May pose health risks to workers and public safety
Towards a cancer free workplace

http://occupationalcancer.ca