

# The influence of work patterns on indicators of cardiometabolic risk in female hospital employees

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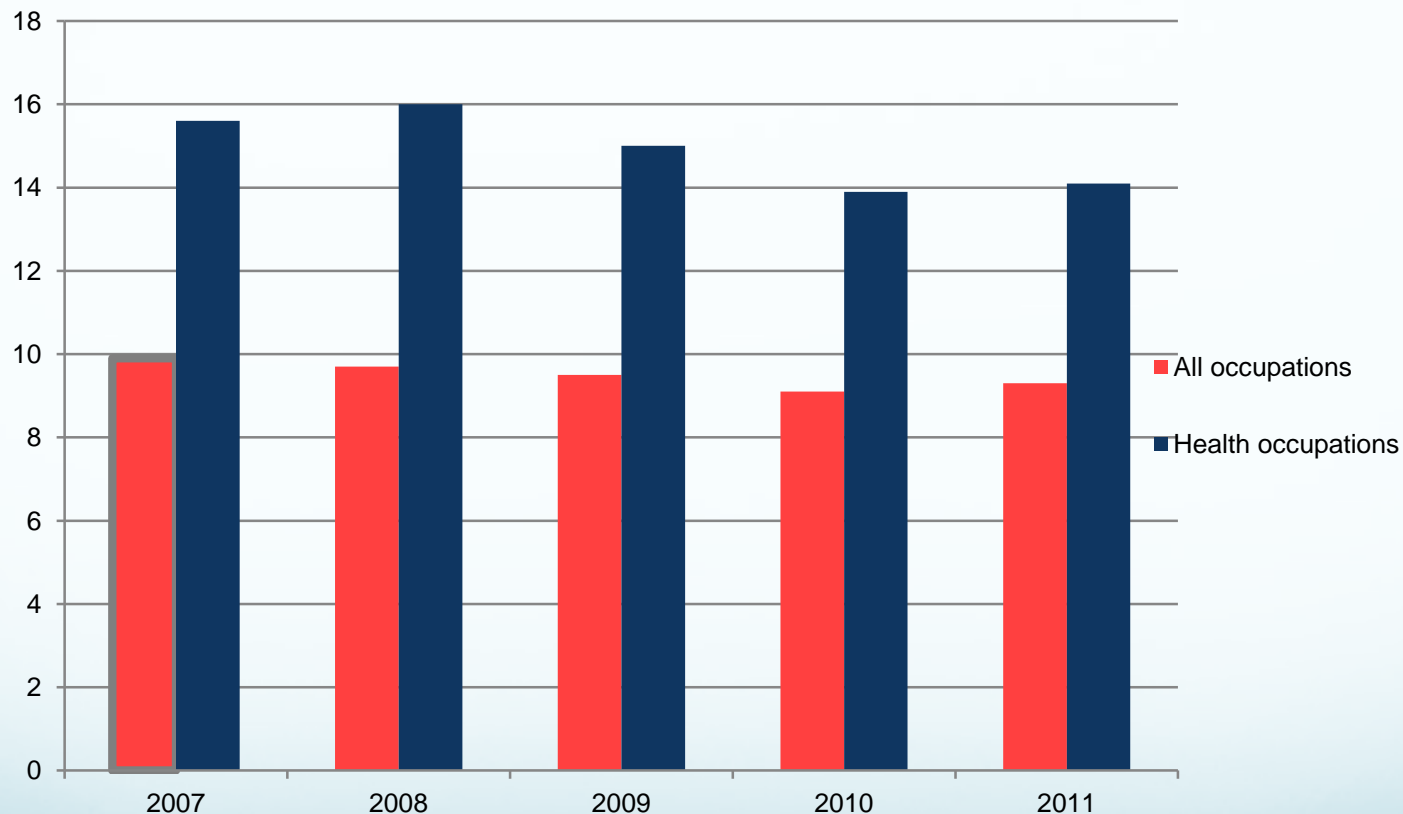
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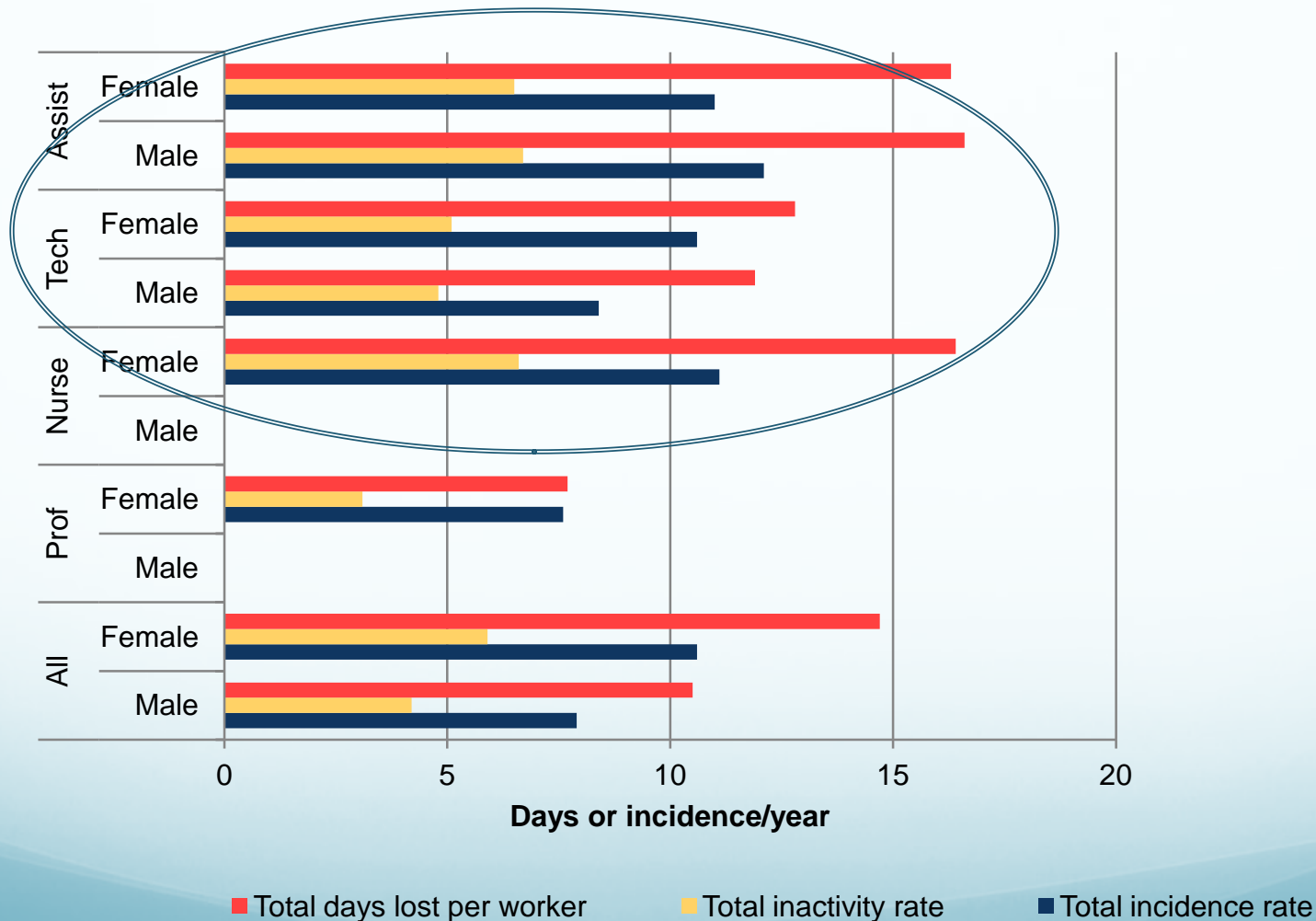


# The problem: Health workers have higher personal days lost



Labour force survey estimates (LSF), average days lost for personal reasons per full time employee by NOC-S, Statistics Canada

# Lost time is different by sex and health occupations (2010)



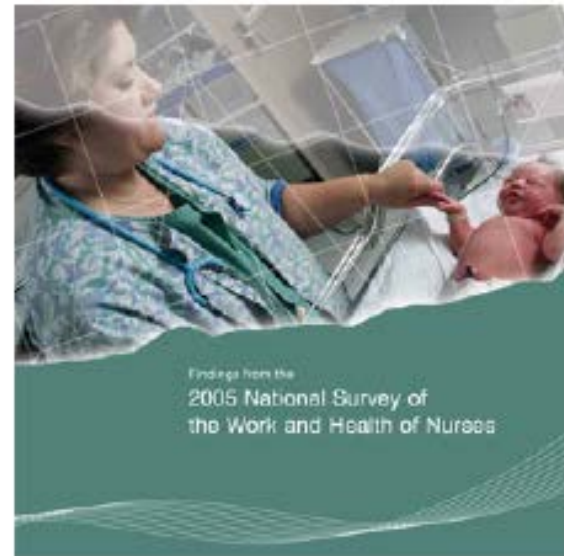
# Risk factors among female nurses

## Canadian Community Health Survey (2003)

- Cross-sectional survey of 135,000 respondents of whom 79,000 had been employed in the past 12 months
- Comparison of **1,900 female nurse survey** respondents to 15,700 women with post-secondary education
- Differences:
  - Higher prevalence of **high blood pressure** (nurses, 12% vs others, 7%) and back problems (nurses, 24% vs others, 20%)
  - More likely to be **overweight** or obese (nurses, 44% vs others, 34%)

# Work and Health of Nurses 2005 Survey (CIHI)

- Average age of nurses in 2005 was 44.3 years
- More than 60% of nurses reported their jobs represented high physical demands
- Back problems, pain, arthritis and depression were commonly reported
- Fair or poor general health was related to components of work stress, strain and high physical demands
- Work absences for health related reasons totaling 20 days or more were common.



***About one third of the population reported that their physical health made it difficult to handle the workload.***

# Hospital work factors potentially associated with poor health

- Duration of work
  - 12 hour shifts
- Shift work
  - Night shift
- Job strain
  - High demand – low control
- Unpredictable, stressful events
  - Trauma, death, illness,
- Low support
  - Hierarchical organizations



# The issue: Work related factors impact women's health

- In health care settings, women account for approximately 80% of the workforce.
- Female health workers report greater loss time from work.
- Work characteristics, such as shift work, along with an aging workforce may predispose adult working women to increased risk for chronic disease (i.e., cardiovascular disease).
- Poor health (absenteeism and/or presenteeism) may influence the quality and cost of care.
- Understanding the prevalence of the problem and mechanisms that link work related factors to poor health should inform workplace health and policy.

# Research questions

- What is the prevalence of cardiometabolic risk indicators in a cohort of female hospital employees?
- What are the associations between regular and irregular work patterns and indicators of cardiometabolic risk, specifically of the metabolic syndrome?



# Methods

- Cross-sectional descriptive design (2008)
- Participants (n ~ 466) were female hospital employees from two hospital sites in southeastern Ontario.
- Indicators of cardiometabolic risk were obtained by clinical exam and serum sampling
- Self-report data were collected through a questionnaire containing measures of work characteristics and validated measures of covariates (i.e., physical activity)
- Administrative hospital work (paid hour) data

# Outcomes of interest

- **Cardiometabolic risk:** determined by metabolic syndrome criteria (or Tx).
  - High fasting blood glucose ( $> 5.6$  mmol/l)
  - Abdominal obesity ( $\geq 80$  cm)
  - Hypertension ( $\geq 130$  mmHg systolic or  $\geq 85$  mmHg diastolic)
  - Elevated triglycerides ( $\geq 1.7$  mmol/l)
  - Low HDL cholesterol ( $\leq 1.3$  mmol/l)

# Characteristics of sample

- Mean age 46 years (SD 10)
- 77% married/common-law
- 51% > \$75,000 annual household income
- 33% completed university degree or higher
- 42% nurses
- 74% full time
- 36% rotated shifts; 32% worked extended shifts
- 51% had past history of shift work > 6 years

# Characteristics of sample in relation to work patterns

	Rotational Shift		Length of Shift		Overtime Hours	
	Days	Other	8 hour	Other	No	Yes
n	300	166	319	147	317	149
(%)	(64.4)	(35.6)	(68.5)	(31.5)	(68.0)	(32.0)
Age (Mean, SD)	46.8 (8.7)	<b>44.0*</b> <b>(10.4)</b>	47.0 (8.9)	<b>43.2*</b> <b>(10.1)</b>	46.4 (8.9)	<b>44.5*</b> <b>(8.9)</b>
Married	243 (81.0)	<b>117*</b> <b>(70.5)</b>	256 (80.3)	<b>104*</b> <b>(70.7)</b>	250 (78.9)	110 (73.8)
Household income $\geq$ &75,000	155 (52.9)	82 (50.3)	153 (49.4)	84 (57.5)	155 (50.2)	82 (55.8)
Highest education (degree or more)	112 (37.5)	<b>40*</b> <b>(24.1)</b>	99 (31.1)	53 (36.1)	113 (35.8)	<b>39*</b> <b>(26.2)</b>

# Prevalence of cardiometabolic risk indicators

	<b>Prevalence</b>
	<b>n (%)</b>
<b>Elevated waist circumference</b>	<b>268 (57.5)</b>
<b>Elevated blood pressure</b>	<b>177 (38.0)</b>
<b>Elevated glucose</b>	<b>74 (16.5)</b>
<b>Elevated triglycerides</b>	<b>70 (15.0)</b>
<b>Reduced HDL cholesterol</b>	<b>97 (20.8)</b>
<b>Metabolic syndrome (MS)</b>	<b>98 (21.0)</b>

# Associations between work patterns and cardiometabolic risk

	All work patterns combined OR (95% CI)			
	Full time vs. part time (referent)	Rotational vs. day (referent)	Other vs. 8 hour shift length (referent)	≥ 35 hours of paid overtime vs. less (referent)
Adjusted for:				
Age and all work patterns	<b>2.2*</b> <b>(1.18-3.96)</b>	0.9 (0.48-1.75)	<b>1.8*</b> <b>(1.01-3.17)</b>	<b>1.8*</b> <b>(1.00-3.33)</b>
Previous, plus personal characteristics	<b>2.2*</b> <b>(1.19-4.08)</b>	0.8 (0.43-1.58)	<b>1.9*</b> <b>(1.07-3.48)</b>	1.7 (0.93-3.14)
Previous, plus leisure time physical activity	1.6 (0.83-3.27)	1.0 (0.51-2.06)	1.6 (0.82-3.10)	1.5 (0.79-3.04)

# Summary of findings

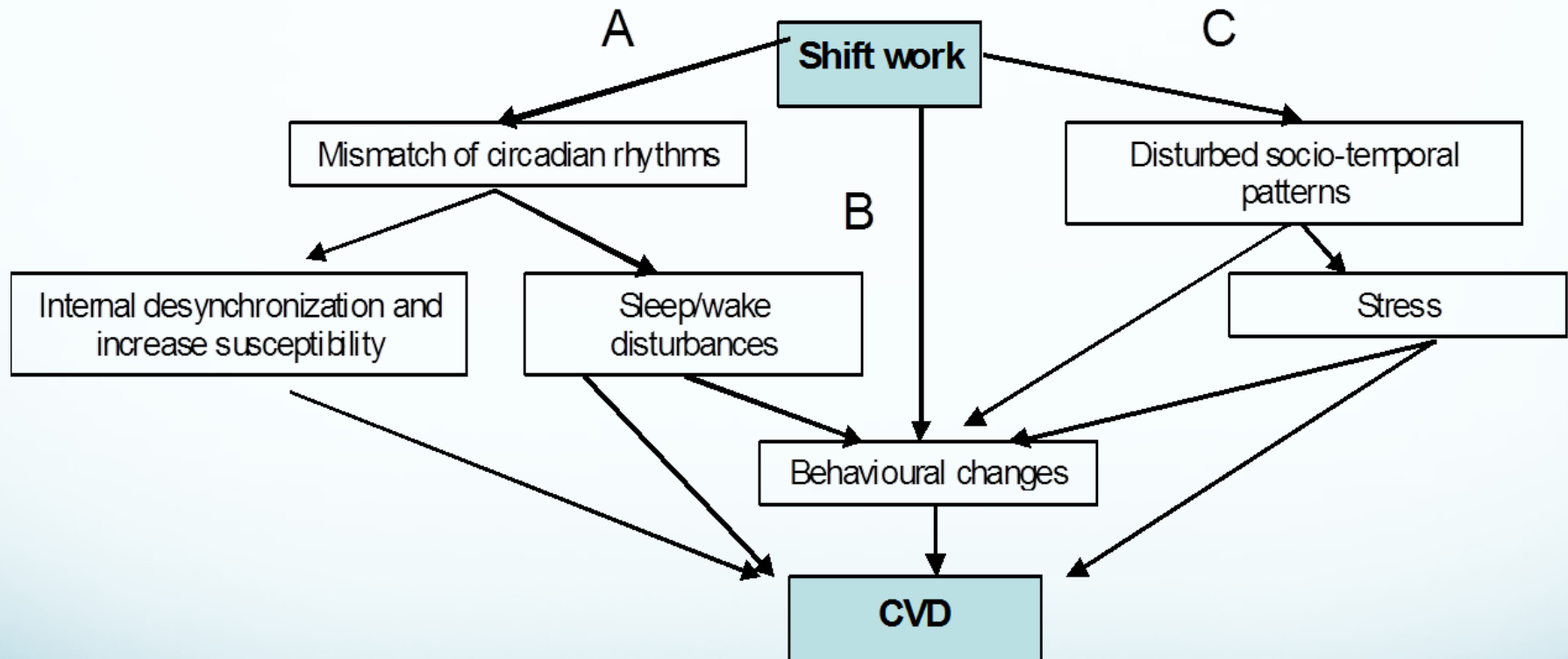
- Prevalence of cardiometabolic risk indicators (20%) is relatively high
  - Of particular concern: abdominal obesity and hypertension
- The following work characteristics were associated with a two-fold increase in presence of MS:
  - **12 hour shifts**
  - **Full time status**
  - **Working overtime hours**
- These associations were completely attenuated by engaging in leisure time physical activity

# Next steps: Ongoing research

- Further analysis will explore the influence of other potential behavioural pathways (i.e., physical activity, diet patterns, home demands)
- Ongoing research: Currently we are conducting a detailed etiological study that is exploring the physiological, behavioural, and social pathways that may link shift work to increased cardiovascular risk and depression. (CIHR:2011-2014)
- Future research: Early indicators of CV risk (i.e., vascular changes) and development of healthy work place strategies (i.e., screening, monitoring, and intervention)



# Linking work characteristics to health: complex and multifactorial



# Practice and policy implications

- Despite a concerted effort to improve the health of the healthcare workforce, there has been minimal impact on the health of female employees. This would suggest that we need to re-examine workplace environments and supports.
- Some suggestions are:
  - To carefully monitor the health of the workforce
  - To clearly identify sources of job strain
  - To implement strategies to minimize the influence of potentially harmful work characteristics on health (i.e., awareness of intergenerational needs)
  - To provide innovative, accessible and effective health-promotion strategies

# In conclusion...



**Opportunity for improvement – one step at a time!**

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