What are the health effects of night and alternating shift work?

Evidence-Based Answer
The answer is unclear. Individuals doing shift work have an increased risk of myocardial infarction, coronary events, and ischemic stroke, although a causal link has not been proven (SOR: B, meta-analysis of cohort and case-control trials). There also appears to be an association with the development of the metabolic syndrome in men and breast cancer in women (SOR: B, prospective cohort and single case-control studies).

In a recent meta-analysis, 34 multinational (Austria, Canada, Denmark, Finland, Germany, Iceland, Italy, Japan, Norway, Sweden, Qatar, UK, USA) observational studies (11 prospective cohorts, 13 retrospective cohorts, and 10 case-control analyses; >2 million patients) were reviewed to assess the association of shift work (any work schedule that is not approximately 9:00 am to 5:00 pm) and major vascular events in widely diversified, international populations and work environments.1

Compared with non-shift work, shift work was associated with an increased risk of myocardial infarction (10 trials, 1.1 million patients; risk ratio [RR] 1.2; 95% CI, 1.2–1.3), ischemic stroke (28 trials, 1.5 million patients; RR 1.1; 95% CI, 1.0–1.1), and coronary events (2 trials; N=81,000; RR 1.2; 95% CI, 1.1–1.4), independent of smoking and socioeconomic status. The key weakness was that the study design did not allow for conclusions regarding causality.1

A 2008 prospective study of Belgian men (N=1,529 from 6 private companies, 2 pubic administrations, and 1 bank) over a median observation period of 6.6 years compared the incidence of metabolic syndrome in shift workers (n=309) and day workers (n=1,220).2 Risk of metabolic syndrome in shift work was significantly increased (61 per 1,000 person-years in shift workers vs 37 per 1,000 person-years in day workers; OR 1.8; 95% CI, 1.3–2.3).

There were also increases in hypertension (≥130/85 mmHg or need for antihypertensive medications; OR 1.3; 95% CI, 1.0–1.7), low levels of high-density lipoprotein cholesterol (<40 mg/dL; OR 1.4; 95% CI, 1.0–1.9), nonfasting glucose ≥120 mg/dL or type 2 diabetes (OR 1.6; 95% CI, 1.2–2.1), and hypertriglyceridemia (≥220 mg/dL; OR 1.5; 95% CI, 1.2–1.9) when compared with baseline examinations. Limitations of the study included gender bias (small number of women performing shift work) and more homogeneous populations and work environments than in other countries.2

A 2012 Danish military, case-control study compared the night shift work records of 141 women with breast cancer and 551 age-matched controls (<1 year of night work).3 The duration of night shift work exposure was associated with a higher rates of breast cancer. Women with the most exposure to night shift work (≥3 times/wk for ≥15 years) had the greatest risk for breast cancer (OR 2.5; 95% CI, 1.0–6.6) compared with controls (women never exposed to night shift as a preference). Women with moderate exposure had a moderate risk (≥3 times/wk for 6–15 years; OR 2.1; 95% CI, 1.0–4.8) compared with controls. Minimal exposure did not alter risk compared with controls (≥3 times/wk for 1–5.9 years; OR 1.1; 95% CI, 0.5–2.3).

These findings were present even when data were adjusted for age, hormone replacement therapy, number of childbirths, age at menarche, years of education, sunbathing frequency, and tobacco smoking status. Limitations of the study included small study size, case-control design, and homogeneous population.3

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Evidence-Based Practice learning objectives

1. To become knowledgeable about evidence-based solutions to commonly encountered clinical problems.
2. To understand how ground-breaking research is changing the practice of family medicine.
3. To become conversant with balanced appraisals of drugs that are marketed to physicians and consumers.