Discussion Both those taking IHR and MS showed a slight improvement in this aspect of lung function during the course of their careers, generally supporting earlier findings of West Sussex and London firefighters.

Declaration of potential conflict of interest: Author was previously Medical Adviser to the Fire and Rescue Service whose data is the subject of this project.

Oral Presentation

Shift Work

0415 WORKING AROUND THE CLOCK: AN EXPOSURE RESPONSE RELATIONSHIP BETWEEN NIGHT WORK AND INCIDENT HYPERTENSION

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Night work, or work outside of 7am to 6pm, causes chronobiologic rhythm disruption which may cause an increase in hypertension risk. To study this question, we assessed the association between night work and incident hypertension using three exposure metrics.

A cohort of 2941 new hires at 9 aluminium smelter and fabrication facilities were followed from 2003 through 2013 for incident hypertension defined by insurance claim's ICD-9 codes. Night shifts were classified as shifts with ≥ 3 hours between 12am-5am using time-registry data. Night work exposure in the previous year was defined three ways; two binary metrics adapted from previous studies: 1) Ever/Never, 2) Working $\geq$ or < 36 night shifts; and a quantitative metric 3) Percentage of night shifts.

The association between hypertension and each exposure metric was estimated in separate Cox proportional hazards models, adjusting for age, sex, gender, facility, smoking history, annual BMI, annual health claims based risk score, and duration of past night work.

The rate of incident hypertension among workers with night work in the previous year was 1.88 (95% CI [1.16–3.05]) and 1.40 (1.00–1.96) times the rate among workers with no recent night work using metric 1 and 2 respectively. Compared with workers with no recent night work exposure, the hazard ratio among workers with >0 – $<5\%$, 5 – $<25\%$, 25 – $<50\%$, and $\geq 50\%$ night shifts in the previous year were 1.62 (.93–2.83), 1.83 (1.05–3.20), 2.20 (1.29–3.78) and 2.29 (1.24–4.20) respectively ($P_{\text{Trend}}=0.004$).

Our results suggest recent degree of night shift exposure may be associated with higher rates of hypertension.

Poster Presentation

Exposure Assessment

0416 RELATIONSHIP BETWEEN EXTRACELLULAR IRON AND CIRCULATING INFLAMMATION MARKERS IN PLASMA OF MINNESOTA TACONITE WORKERS

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Background Higher rates of mesothelioma, pneumoconiosis, lung cancer, and heart disease mortality have been reported in Minnesota taconite (iron ore) workers compared to the rest of the state population. Oxidative stress and inflammation are important underlying mechanisms in cancer and cardiovascular disease, and exposure to silica containing dust with a high iron content may play a key role in the observed elevated health risks.

Methods In this study, we compared ICP-MS-measured plasma iron concentrations to levels of circulating inflammatory markers (cytokines and chemokines) in 130 taconite workers using linear regression analysis adjusting for covariates.

Results Plasma iron levels varied substantially, ranging from 49 to 636 $\mu\text{g/dL}$, with a mean of 107 (± 60) $\mu\text{g/dL}$. After adjusting for age, body mass index, gender and smoking status, plasma iron levels were positively associated with the levels of chemokines RANTES ($p=0.06$), TARC ($p=0.04$), and MDC ($p=0.02$).

Discussion These findings lend some support to the hypothesis that exposure to iron in taconite dust may lead to elevated levels of extracellular iron both in the lung and in the general circulation, producing reactive oxygen species and catalysing oxidative stress. Given that TARC and MDC have been prospectively associated with lung cancer risk in other research, there is a need to better understand the relationship between extracellular iron levels and these biomarkers in taconite workers. Further analyses to assess other metrics of iron exposure from taconite dust components on plasma iron concentrations and measures of oxidative stress are warranted.

Poster Presentation

Injuries

0418 VIOLENCE IN HEALTHCARE: HOW DOES IT AFFECT RETURN-TO-WORK AFTER WORK INJURY?

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