

during other times may not increase risk. *Hypothesis 2:* A long, slow pattern of increases in IOP from regular heavy lifting accelerates vitreous liquefaction, so that retinal tears are more likely to occur. Under this hypothesis, changes in IOP don't cause tears directly, but instead a long-term pattern of "peaks" in IOP may increase the chances of an RD. If this is correct, risk of RD would be associated with a longer history of heavy lifting.

## Poster Presentation

### Burden of Disease

#### 0128 THE ECONOMIC BURDEN OF OCCUPATIONAL HEAT ILLNESSES IN ADELAIDE, SOUTH AUSTRALIA, 2001-2015

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**Objectives** This study aims to investigate the characteristics of economic costs of occupational heat illnesses in South Australia, and to examine the association between high temperatures and occupational heat illness related economic costs.

**Methods** Workers' compensation claim data were obtained from SafeWork South Australia for the period of 2001–2015. Weather data were collected from the Bureau of Meteorology. The association between heat illness and economic loss was estimated by time-series analysis with generalized estimating equation models after controlling for day of week and long-term trends.

**Results** There were 306 occupational heat illness claims during the study period, resulting in medical expenditure of \$1,795,640 and 2,787 days of time loss. Male workers accounted for 87.8% and 82.5% of medical costs and time-lost days, respectively. The mining industry had the greatest proportion of medical expenditure (56.0%) and days off work due to heat illnesses (67.4%), followed by "community services" and "agriculture, forestry and fishing". There was a positive relationship between maximum temperature (Tmax), medical expenditure, and days of time lost. A 1°C increase of Tmax was associated with 18.5% (IRR 1.185, 95% CI 1.071–1.312) increase in medical expenditure and 34.6% (IRR 1.346, 95% CI 1.128–1.534) increase in time-lost days due to occupational heat illnesses, respectively.

**Conclusions** Occupational heat related-illnesses represent a significant economic cost, and interventions in South Australia should be targeted at the mining industry.

## Poster Presentation

### Musculoskeletal

#### 0129 MUSCULOSKELETAL PAIN AND WORKSTATION ASSESSMENTS AMONG OFFICE WORKERS IN A PUBLIC UNIVERSITY IN COSTA RICA

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**Objectives** To determine the prevalence of musculoskeletal pain (MSP) and identify workstation factors that might

influence pain among office worker in a public university in Costa Rica.

**Methods** A sample of office workers (n=162, 13% of population) were selected at the main campus of the Costa Rica Institute of Technology. Information on MSP was collected using the Cornell Musculoskeletal Questionnaire. Collected data on workstations using OSHA Computer Evaluation Checklist. We used descriptive statistics to analyse data, prevalence was summarised in frequencies and percentages using Stata v13.

**Results** Prevalence of MSP was 88.2%, pain was higher among women (51.2%) than men (37.0%) and lower prevalence (17.9%) among older workers (more than 51 years of age). Musculoskeletal pain was most common in the lower back (68.3%), followed by neck (60.4%), upper back (51.8%) and wrist (24.4%). Main findings regarding workstation and postural problems were wrists not straight (63.6%), wrists/hands rest on sharp or hard edges (54.7%), glare present (51.7%), platform is not large enough to hold a keyboard and a mouse (50.8%), head, neck, and trunk do not face forward (42.1%), top of the screen is not at eye level (38.5%).

**Conclusion** Prevalence of MSP was common among office workers, but with a higher prevalence among women and younger people. High prevalence of pain highlights the importance of workplace interventions to reduce the influence on discomfort due to workstation design. In addition, office ergonomics training to all office worker could raise awareness and reduce risk factors due to behavioural problems.

## Oral Presentation

### Respiratory

#### 0130 INCIDENCE OF WORK-RELATED RESPIRATORY ILL HEALTH ATTRIBUTED TO CLEANING AGENTS: OCCUPATIONAL AND CHEMICAL DETERMINANTS

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**Introduction** Exposure to cleaning products has been shown to be associated with adverse respiratory outcomes. The aim of this study was to investigate the medically reported incidence and occupational determinants of work-related respiratory disorders attributed to cleaning agents, and to explore the role of a chemical taxonomy and 'Quantitative Structure Activity Relationships' (QSAR) in categorising hazards and their mechanisms.

**Methods** Cases of work-related respiratory disease attributed to cleaning agents were identified and extracted from SWORD (Surveillance of Work-Related and Occupational Respiratory Disease), 1989–2015. Incidence, trends in incidence and incidence rate ratios (IRRs) by occupation were investigated. Agents were classified by chemical type and QSAR hazard indices were determined on selected typical organic chemicals.

**Results** A reported 667 cases (6% of the non-asbestos related cases) were attributed to cleaning agents. Diagnoses were predominantly asthma (58%) and inhalation accidents (29%). The agents were classified in ten specific chemical categories with the most frequently reported being aldehydes (33%) and chlorine/releasers (25%). An overall decrease in incidence of

−4.4% (95% CI: −6.8, −2.0) per year was observed. A large variation in risk was observed with the incidence for the highest risk occupation, 'launderers, dry cleaners and pressers', being more than 50 times the average of all other occupations. A high QSAR asthma hazard index was found in agents which were likely sensitizers.

**Conclusion** The data highlight a number of occupations at increased risk of adverse respiratory outcomes attributed to cleaning agents. Chemical features of the cleaning agents helped distinguish between sensitizing and irritant agents.

## Poster Presentation

### Occupational Medicine (SCOM/Modernet)

#### 0132 IMMUNOLOGICAL HAZARDS IN ENGINEERED NANOMATERIAL HANDLING WORKERS

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Based on our previous study, we found that allergic dermatitis was a prominent presentation in worker with engineered nanomaterials (ENMs) exposure. The objective of this study was to disclose the plausible immunological mechanism of allergic diseases in ENMs handling workers. We investigated 14 ENMs factories with 227 exposed workers and 137 non-exposed controls in Taiwan. We used questionnaire to collect exposures severity and probability scores and group the risk level (1 to 4) of each worker. The greater the risk level (RL), the higher the severity of nanomaterial toxicity and/or the higher the exposure probability. We found the distribution of characteristics in months of work ( $p=0.05$ ), gender ( $p<0.01$ ), education ( $p=0.001$ ), smoking ( $p=0.001$ ) and alcohol drinking ( $p=0.011$ ) differed significantly between RL and control group. The LnIgE values among characteristics of study population showed the younger age ( $p<0.01$ ) and male ( $p=0.034$ ) had higher LnIgE values. After adjusted the confounders in multiple linear regression models, our results demonstrated that increased LnIgE values was significantly associated with RL2 ( $p=0.048$ ), months of works above 42 months ( $p=0.008$ ), CNT exposure ( $p=0.047$ ) and nano-SiO<sub>2</sub> exposure ( $p=0.034$ ).

To our best knowledge, our study was the first study between ENMs exposure and immune responses in human. Our study highlighted that serum LnIgE values and exposure probability scores could have a positive association in the ENMs exposed worker. Moreover, the worker who exposed to CNT and nano-SiO<sub>2</sub> might be more susceptible to IgE mediated allergic problems, like allergic dermatitis in our study population.

## Oral Presentation

### Respiratory

#### 0133 ENVIRONMENTAL AND OCCUPATIONAL TRIGGERS OF COPD SYMPTOMS: A CASE CROSSOVER STUDY

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**Introduction** This study investigated the hypothesis that common occupational and environmental chemical exposures with known irritant or sensitizing properties trigger exacerbations for patients with chronic obstructive pulmonary disease (COPD).

**Methods** We conducted a case crossover study in 168 COPD patients who were members of a disease management group (DMG) in central Massachusetts. Participants completed a baseline health survey and several short exposure surveys. Exposure surveys were administered by a nurse when a participant telephoned to report an exacerbation (case periods) and at a maximum of 3 randomly identified control periods when they were not experiencing an exacerbation. We compared exposures in the week preceding an exacerbation with exposures in normal (non-exacerbation) weeks. The questionnaire assessed short-term (one week) home, community and workplace activities and exposures that may be associated with COPD exacerbation.

**Result** Self-reported exercise was protective (OR=0.59 95% CI: 0.35–1.00). Among the chemical exposures, car and truck exhaust (OR=4.36, 95% CI: 1.76–10.80) and use of scented laundry products (OR=2.69, 95% CI: 1.31–5.52) showed strong positive effects. Self-reported respiratory infections were strongly associated with COPD exacerbation (OR=7.90, 95% CI: 4.29–14.50). Variations in outdoor temperature were associated with COPD exacerbation risk (moderate versus cold temperature OR=1.95, 95% CI: 0.26–0.70).

**Discussion** These results suggest that some environmental chemical exposures may play a role in triggering COPD exacerbations. If confirmed, they may provide useful guidance for COPD patients to better manage their diseases.

## Oral Presentation

### Methodology

#### 0134 WHAT TO EXPECT FROM YOUR EXPECTED

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**Objectives** Epidemiologists often compare the observed number of deaths in a cohort to the expected number obtained by