

after diagnosis. Presumably, cancer progression and treatment may cause opportunistic infections. Further evaluation is necessary to support this result.

Poster Presentation Exposure Assessment

0407 RESPIRATORY IRRITANT EXPOSURES DURING CLEANING AND DISINFECTING IN HOME CARE: PRELIMINARY RESULTS FROM THE SAFE HOME CARE STUDY

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Objectives While there is evidence of asthma and other respiratory illness among workers performing cleaning and disinfecting (C and D) of environmental surfaces in healthcare and in residential and institutional settings, quantitative measurements of C and D exposures are limited. Previously, we found that 80% of home care (HC) aide visits to clients' homes involve C and D; commonly-used C and D products contain bleach, a respiratory irritant. Objectives of this study were to measure quantitatively airborne exposures generated during C and D tasks performed by HC aides using a bleach-containing product. The work reported here is part of a larger evaluation of exposures and respiratory effects of a range of C and D products and practices and their efficacy in reducing pathogens in HC.

Methods A bathroom was constructed in a laboratory according to home building construction specifications. Twenty HC aides were recruited from employer agencies to perform C and D tasks for 20 min sessions in the bathroom following typical HC practices using a C and D spray product containing bleach (1%–5% by weight sodium hypochlorite). Aides wore a vest holding a direct-reading instrument to measure chlorine breathing-zone concentrations as they performed C and D on tub/shower, toilet, and sink.

Results Maximum chlorine concentrations generated during the 20 min sessions ranged from 0.35ppm to 3.40ppm. The tub/shower C and D task produced the highest exposures. The US Occupational Safety and Health Administration ceiling limit for chlorine is 1 ppm; nearly 70% of the aides conducted a C and D session exceeding this value.

Conclusions C and D in HC using a product containing bleach can produce over-exposure to chlorine, a respiratory irritant.

Poster Presentation Chemicals

0408 WORKERS' EXPOSURE TO BROMINATED FLAME RETARDANTS: A GLANCE AT AMERICAN AND CANADIAN POPULATION DATABASES

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We aim to determine biological concentrations of four congeners of brominated flame retardants, which have no occupational exposure limits, in American and Canadian workers.

Serum concentrations of four polybrominated diphenyl ethers congeners (BDE47, 99, 100 and 153) were obtained from the American National Health And Nutrition Examination Survey (NHANES) 2003–2004 and the Canadian Health Measures Survey (CHMS) 2007–2009 databases. Data from participants aged 16–65 were classified by industry and occupational group. Values below the detection limit (< LOD) were replaced by LOD/ $\sqrt{2}$. Descriptive statistics are presented.

A total of 813 and 1100 serum samples were respectively available in NHANES and CHMS. Proportions of values < LOD varied by survey: BDE47 (NHANES, 1.4%; CHMS, 22.7%), BDE99 (32.3%; 73.9%), BDE100 (4.7%; 72.9%), BDE153 (5.7%; 55.9%). BDE47 was the congener with the highest lipid-adjusted mean concentrations (NHANES, 44.5 ng/g; CHMS, 22.8 ng/g). Higher BDE47 means were found in Agriculture, Forestry and Fishing industries (61.9 ng/g) and in Protective Services and Armed Forces occupations (48.5 ng/g) for NHANES, whereas in CHMS they were higher in Manufacturing of Durable Goods industries (40.3 ng/g) and in Construction and Extraction occupations (44.7 ng/g). BDE153 means were higher for men than for women in both databases (NHANES-men: 16.8 ng/g, NHANES-women: 11.4 ng/g; CHMS-men: 11.0 ng/g, CHMS-women: 7.8 ng/g). In NHANES, non-working men had higher mean concentrations than workers for all congeners.

In the absence of occupational exposure limits, population surveys can be useful to establish reference levels, but careful interpretation is required for chemicals such as flame retardants that are ubiquitous in both the general and work environments.