

baseline. Increases in SHS-related PM<sub>2.5</sub> exposures were associated with significant ( $p < 0.01$ ) increases in next morning CRP, s-ICAM, and s-VCAM levels.

**Conclusions** Our results indicate that exposure to SHS can lead to a cardiovascular inflammatory response approximately 18 h following SHS exposures, further supporting a pathway between SHS exposure and adverse cardiovascular outcomes.

**0235 BARRIERS AND FACILITATORS OF SUPPLYING A TREADMILL WORKSTATION TO OFFICE WORKERS: USABILITY, SAFETY, COMFORT, AND PRODUCTIVITY. A QUALITATIVE STUDY**

Manuel Cifuentes, Jin Qin, Scott Fulmer, Anila Bello. *Work Environment Department, University of Massachusetts Lowell, MA, USA*

10.1136/oemed-2014-102362.99

**Objectives** Characterise usability, safety, comfort, and impact on productivity of treadmill workstations in real worksites.

**Method** Office workers volunteered to try out for six months a treadmill workstation consisting of a height adjustable electric desk, a walking treadmill, and their own sitting device (chair or "sitting ball"). They were instructed to set up and use the workstation at will. Monthly individual and group meetings were performed to gather qualitative data.

**Results** **USABILITY:** Difficult set up of the workstation, which demanded use of wireless mouse and keyboards and generated creative arrangements. Unanimous love for the adjustable electric desk. Difficult to talk to people while walking (disrespectful, "On the treadmill we are taller" - affect hierarchies). **SAFETY:** There was no event of either trips or falls. **COMFORT:** An important difficulty was during the first weeks to get used to longer time in standing position. In average it took two weeks for discomfort symptoms in foot and knees to recede. **PRODUCTIVITY:** faster speed implies faster impact on productivity. 7–8 mph was the most used and comfortable speed. Walking on the treadmill was not compatible with drawing or working with spreadsheets.

**Conclusions** Treadmill workstation did not meet workers' expectations but the electric adjustable desk exceeded those expectations. Guiding and external motivation to increase use would be accepted and expected. **DESIGN RECOMMENDATIONS:** Reduce maximum speed. Even 2.0 mph is too much. Additional design study needed to improve global workstation setup without decreasing flexibility and adaptation of the station.

**0239 INDUCIBLE NITRIC OXIDE SYNTHASE GENE METHYLATION AND PARKINSONISM IN MANGANESE-EXPOSED WELDERS**

<sup>1</sup>Susan Nielsen, <sup>2</sup>Harvey Checkoway, <sup>3</sup>Susan Criswell, <sup>1</sup>Federico Farin, <sup>3,4</sup>Brad Racette. *<sup>1</sup>University of Washington, Seattle, WA, USA; <sup>2</sup>University of California San Diego, San Diego, CA, USA; <sup>3</sup>Washington University School of Medicine, St. Louis, MO, USA; <sup>4</sup>University of the Witwatersrand, Johannesburg, South Africa*

10.1136/oemed-2014-102362.100

**Objectives** To assess whether parkinsonism in manganese (Mn)-exposed welders is associated with methylation of NOS2, a methylation-regulated gene that codes for inducible nitric oxide synthase (iNOS). We hypothesised that parkinsonian welders

would have lower NOS2 methylation than other welders, consistent with greater iNOS activity and an inflammatory pathogenesis.

**Method** In a cohort of U. S. shipyard welders we conducted a nested case-control study of parkinsonism and DNA methylation of a NOS2 region previously suggested to be altered with welding exposure. A movement disorders specialist examined each subject using the Unified Parkinson Disease Rating Scale motor subsection 3 (UPDRS3). We included 50 parkinsonian welders as cases (UPDRS3 $\geq$ 15), 105 welders with normal exams (UPDRS3 <6), and 50 welders with an intermediate UPDRS3 score ( $\geq$ 6 to <15), all non-Hispanic Caucasian men 25–65 years of age. We used DNA from whole blood and a pyrosequencing assay for 3 CpG (methylation) sites in NOS2 exon 1. We used unconditional polytomous logistic regression to assess the age-adjusted association between parkinsonism and mean NOS2 methylation.

**Results** CpG sites were highly methylated (90.8–98.5% mean methylation) among all subjects. Welders with parkinsonism had significantly lower NOS2 methylation than normal welders (odds ratio [OR]=0.69, 95% confidence interval [CI] 0.49–0.97 per 1% absolute increase in methylation). The welders with intermediate UPDRS3 scores also had lower methylation compared to normal welders (OR=0.88, 95% CI 0.65–1.20) ( $p$  trend = 0.03). Adjustment for smoking did not alter the results.

**Conclusions** This study suggests that inflammation mediated by NOS2 gene expression may underlie the pathophysiology of parkinsonism in Mn-exposed welders.

**0253 HAIRDRESSERS ARE OCCUPATIONALLY EXPOSED TO ORTHO- AND META- TOLUIDINE**

<sup>1</sup>Maria Albin, <sup>1</sup>Gabriella Johansson, <sup>1</sup>Bo Jönsson, <sup>1</sup>Anna Axmon, <sup>1</sup>Christian Lindh, <sup>2</sup>Marie-Louise Lind, <sup>1</sup>Mats Gustavsson, <sup>1</sup>Karin Broberg Palmgren, <sup>2</sup>Anders Boman, <sup>2</sup>Birgitta Meding, <sup>3</sup>Carola Lidén. *<sup>1</sup>Department of Occupational and Environmental Medicine, Lund, Sweden; <sup>2</sup>Institute of Environmental Medicine, Stockholm, Sweden*

10.1136/oemed-2014-102362.101

**Objectives** Hairdressing work is classified as carcinogenic based on excess risk for bladder cancer. We aimed at evaluating if current hairdressers are exposed to established/suspected bladder carcinogens (aromatic amines) and indicate possible sources of exposure.

**Method** Hairdressing salons listed in the telephone book were contacted for personal visits, 295 hairdressers were recruited (an estimated half of the eligible invited subjects). For comparison we included 32 consumers and 60 controls employed at our hospital. The study was restricted to female non-smokers. Questionnaires including frequency of performed work tasks were filled in by the hairdressers, and all subjects reported personal hair dye use, and exposure to environmental tobacco smoke. Blood samples were taken for analysis (gas chromatography-tandem mass spectrometry; GC-MS/MS) of ortho (o)-, meta (m)-, and para (p)-toluidine; 2-, 3-, and 4-ethylaniline, 2,3- and 3,4-dimethylaniline as haemoglobin adducts.

**Results** Adduct concentrations did not differ significantly between hairdressers, consumers and controls. However, for hairdressers, o- and m-toluidine concentrations increased with the weekly performed number of permanent hair dyeings ( $p = 0.026$ ), and hair waving treatments ( $p = 0.020$ ). o- and m-Toluidine concentrations also tended ( $p = 0.076$  and  $0.080$ , respectively) to increase with the frequency of light colour permanent