Objectives Longlasting sitting position has often been associated with the discomfort and/or pain in neck-shoulder region. The objective of this study was to examine the trapezius muscle parameters among sitting and standing workers and to investigate which is more overreaching to trapezius muscle.
Methods A total of 42 female workers in two different companies were recruited in this study. There were 21 workers (sitting workers) who were sitting at the computer most of the working day and 21 (standing workers) who were standing at their workstation and assembling the products. Trapezius muscle mechanical charecteritics were measured by myotonometry, which calculates objective parameters on state of muscle mechanical properties (frequency which characterising tone, decrement which characterising elasticity and stiffness). The upper trapezius muscle was measured at resting position in seated, both on the left and right side. Also the visual analogue scale (VAS) was used to assess the intensity of pain in neck and shoulder region. The differences between two groups were assessed with indenpendent group T-test.
Results The mean neck and shoulder pain VAS score among standing workers was 1.79 (SD 2.36) and 1.36 (SD 2.35) and among sitting workers 2.40 (SD 2.75) and 2.17 (SD 2.52) respectively. The measured outcomes showed that frequency in the right side was 15.5% and in the left side 14.9% higher among sitting workers. Stiffness was also higher among sitting workers respectively 22.6% and 25.5%. Trapezius muscle frequency and stiffness were also statistically higher in sitting workers (t-test $p \leq 0.001$) and in both body sites. There were no differences in decrement.
Conclusions The result showed that sitting work induces higher tone and stiffness in upper trapezius muscle than standing work. Considering that the ergonomic workplace reorganisation should be done.

92 PREVALENCE OF MUSCULOSKELETAL DISORDERS AMONG US EMPLOYEES OF A LARGE COMPANY

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Objectives Musculoskeletal disorders (MSDs) are a leading cause of work absenteeism. Risk for MSD is multi-dimensional, and individuals with MSDs have a diverse array of co-morbid mental and physical illnesses that impact productivity in the work place. We examined the prevalence of MSDs, including low back pain (LBP), among US-based workers for a large manufacturing company.
Methods Health insurance claims data for 25,419 employees from 2006 through 2011 were used to determine eligibility and outcome status. 92% of the workforce is enrolled in a company-sponsored health insurance plan. Employees were categorised as ever having any MSD according to the presence of at least one insurance claim for a list of conditions based on ICD-9 codes. Prevalence of and trends in MSD rates were evaluated for demographic and occupational characteristics.
Results Eligible workers were predominantly white (73%) and male (75%). Median age was 50 years old. The annual average proportion of employees who had at least one MSD insurance claim was 36%. More than 33% of the MSD claims were for LBP. Female employees were more likely to have an MSD-related insurance claim than males ($p < 0.01$). The annual prevalence rate was consistent during the eligibility period, and a strong linear trend between age and any MSD-related claim was observed ($p < 0.01$).
Conclusions The findings of this analysis highlight the magnitude of MSD prevalence for an ageing workforce. The prevalence of MSDs based on insurance claims was consistent with rates reported by the US Bureau of Labour Statistics for MSDs involving work absences from 1992 to 2007 (29 to 34%). The claims-based prevalence for this workforce was lower than the self-reported proportion of MSD for the U. S. adult population (48%). These results will inform identification and management of occupational conditions that address the impact of MSDs on work productivity.

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93 REVIEW OF THE MALE REPRODUCTIVE HEALTH EFFECTS OF HORMONALLY ACTIVE CONVENTIONAL AGRICULTURAL PESTICIDES USED IN SOUTH AFRICA

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Objectives The objective of this literature review was to examine and present evidence on male reproductive health effects of hormonally active conventional agricultural pesticides used in South Africa in order evaluate the need for research in this area especially in the Western Cape, a major agricultural area in the country.
Methods The literature review included electronic and paper sources of information using PubMED/MEDLINE, EBSCO, Google Scholar and The Cochrane Library as well as theses through the University of Cape Town Medical Library. Key words for the searches included pesticides, male reproduction, endocrine disruption, farm workers, farm residents and rural residents. Data from both animal studies and epidemiological studies including all study designs and countries were considered.
Results The review indentified a number (n = 11) of contemporary-use agricultural pesticides that have been shown to induce *in vitro* endocrine activity and/or have been shown to affect gonadotrophin and steroid hormone release as well as male reproductive development in animals or humans. These pesticides include chlorpyrifos, cypermethrin, endosulfan, deltamethrin, dichlorvos, DNOC, fenvelerate, glyphosate, iprodione, parathion and procloraz. Rural residents in the Western Cape especially those living on farms including children are highly exposed occupationally and non-occupationally to pesticides through a number of routes. There are, however, few epidemiological studies that have investigated male reproductive health effects in humans consequent to environmental exposure to conventional agricultural pesticides and only two in South Africa. There are no longitudinal studies.
Conclusions More epidemiological studies, especially longitudinal investigations of specific pesticides in highly exposed workers and residents especially boys in settings such as the Western Cape in South Africa are required.

94 MALE HORMONAL PROFILE TO WORKERS EXPOSED TO TOLUENE IN A PACKAGING PLANT INDUSTRIAL IN MEXICO CITY

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It is not well established that long-term contact to low concentration of toluene produces changes in male hormonal profile (MHP).

Objective To identify changes in the MHP, consisting of luteinizing hormone (LH), follicle-stimulating hormone (FSH) and testosterone, in workers exposed to toluene in an industrial packaging plant in Mexico City.

Material and Methods Cross-sectional study that included 42 workers, from which were formed two groups: with high (HET) and low (LET) exposure to toluene; serum FSH, LH, testosterone and acid hippuric in urine were measured in all subjects.

RESULTS Hippuric acid in subjects with LET: 2.53 ± 1.20 g/g creatinine, and with HET: 6.31 ± 3.83 g/g creatinine (p = 0.02). Seric FSH concentration: 5.12 ± 0.77 and 3.55 ± 0.3 mU/mL (p = 0.02) in LET and HET respectively; LH: 2.66 ± 0.45 and 2.77 ± 0.21 (p = 0.81), and testosterone: 3.91 ± 0.34 and 4.86 ± 0.23 ng/mL (p = 0.04). By regression analysis, the correlation coefficient of FSH with hippuric acid: -0,182 (p = 0.031), with coefficient of determination of 11%, the LH: -0,007 (p = 0.88) and 0.05% respectively, and testosterone: + 0209 (p = 0.0001) and 34%.

Conclusions The effect of toluene is evident on FSH; LH also decreased but not overwhelming; testosterone seems to have opposite response, perhaps explained by different sensitivity of the male gonads to toluene exposure. These findings appear to be the initial changes in MHP of workers exposed to the solvent in question.

95 EXPOSURE TO POLYCYCLIC AROMATIC HYDROCARBONS AND SPERM DNA INTEGRITY OF COKE OVEN WORKERS

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The objective of this study was to examine sperm DNA integrity of coke-oven workers in relation to exposure to PAHs from coke processing. A total of 72 human subjects participated in this study: 24 topside-oven workers, 28 side-oven workers, and 20 administrative personnel serving as the high exposure group, low exposure group, and control, respectively. An exposure assessment was conducted to depict the extent of PAH exposure by measuring urinary 1-hydroxypyrene (1-OHP). DNA fragmentation, 8-oxo-7,8-dihydro-2'-deoxyguanosine (8-oxodGuo), and bulky DNA adducts in sperm DNA were quantified using terminal deoxynucleotidyl transferase-mediated dUTP nick end labelling, liquid chromatography-mass spectrometry/mass spectrometry, and 32P-labelling, respectively. Coke-oven workers had increased levels of DNA fragmentation, 8-oxodGuo, and bulky DNA adducts. However, there was no significant difference in DNA fragmentation levels among the three studied groups ($P = 0.062$). The levels of 8-oxodGuo and bulky DNA adducts in the exposed groups were significantly higher than those in the control ($P = 0.048$ and 0.032, respectively), while controlling for age, alcohol consumption, and smoking. DNA fragmentation positively correlated with 8-oxodGuo, which suggests that oxidative stress may be linked to DNA breakage. Urinary 1-OHP levels did correlate with 8-oxodGuo levels ($P = 0.036$), but not bulky DNA adducts and DNA fragmentation. In summary, exposure to PAHs correlated with oxidative damage and formation of DNA adducts in sperm. Monitoring of sperm DNA integrity is recommended for affected workers as part of any periodic health assessment to determine the impact of occupational toxins on sperm.

96 MENSTRUAL CYCLE CHARACTERISTICS IN EUROPEAN AND INUIT WOMEN EXPOSED TO PERFLUORINATED CHEMICALS: PRELIMINARY FINDINGS FROM A CROSS-SECTIONAL STUDY

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Objectives Perfluorooctanate (PFOA) and perfluorooctane sulfonate (PFOS) are ubiquitous man-made compounds. Studies suggest that they are possible hormonal disruptors, but findings are inconsistent. We examined the association between measured PFOS and PFOA exposure and menstrual cycle length and irregularities in European and Inuit women.

Methods This cross-sectional analysis included 1,037 pregnant women from the INUENDO cohort, enrolled during antenatal care visits between June 2002 and May2004 in Greenland, Poland and Ukraine. Information on menstrual cycle characteristics were obtained by questionnaires and the woman had a blood sample drawn. Serum concentrations of PFOS and PFOA were measured by liquid chromatography tandem mass spectrometry (LC/MS/MS). The association between PFOS/PFOA and menstrual cycle length and irregularities were analysed using logistic regression with tertiles of exposure and stratified by country. Estimates are given as crude odds ratios (ORs) with 95% confidence intervals (CIs).

Results No consistent effects of PFOS and PFOA exposure on menstrual cycle characteristics were observed across all three groups of pregnant women. Within populations, we observed reduced odds of short cycles (≤24 days) among women from Ukraine exposed to high levels of PFOA (OR 0.38, 95% CI 0.15–0.97). However, in Greenland representing the highest exposure level, PFOA was not related to short cycles (OR 1.06, 95% CI 0.21–5.34).

Conclusions These preliminary findings on 1,037 pregnant women from the INUENDO cohort in Greenland, Poland and Ukraine suggest that it is unlikely that exposure to PFOA and PFOS is a main cause of menstrual disturbances.

97 FACTORS ASSOCIATED WITH RETURN TO WORK 6 MONTHS AFTER DELIVERY

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Nowadays, there is increasing non-return to work in pregnant workers. Therefore, the objective of this study was to explore the association between general characteristics, occupational, maternal and infant factors and women returning to work after pregnancy for further improve occupational health service in this population. The retrospective cohort study was conducted in July 2012 at Nopparat Rajthanee Hospital, Bangkok. The data were interviewing workers at Well baby clinic, Nopparat Rajthanee Hospital and Satellite Health Centers. The total population was women who delivered at this hospital in January 2012 and