they work in the market, term of working and smoking habit influenced to plum bum level in the blood, but the most influence based on logistic regression is how long they work (p= 0.033). Conclusion We conclude that plum bum level in air and blood is higher in market seller in the areas with many vehicles and how long they work contribute the most.

SP-140

Skin Lead Contamination of Family Members of Boat-Caulkers in Southern Thailand

Orrapan Untimanon[1], Alan Geater[2], Virasakdi Chongsuvivatwong[2], Wiyada Saetia[3], Sutida Utapan[1]
1. Bureau of Occupational and Environmental Diseases, Thailand
2. Epidemiology Unit, Thailand
3. Office of Disease Prevention and Control 11, Thailand

Wooden-boat building and repair involves the use of powdered lead oxide (Pb3O4, or red lead) as one of the materials used in caulking. This study compared skin lead contamination of family members of boat-caulkers and control homes. It also examined the relationship of family member skin lead with floor lead loading and with dust lead content. Floor lead loading and dust lead content were measured in 67 caulkers' houses and 46 neighbourhood houses with no known lead exposure. In each selected household, wipe specimens of hand lead and foot lead were obtained from one selected family member. Hand lead loading and foot lead loading were significantly higher in family members of caulkers than controls (median 73.4 vs. 32.7 µg m-2; p=0.002 and 84.9 vs 43.4 µg m-2; p=0.002, respectively). This pattern mirrored floor lead loading and dust lead content, which were also higher in caulkers' than in control houses (median 121.2 vs. 43.5 µg m-2; p<0.001, respectively. Multiple linear regression modelling revealed floor lead loading to be a better predictor than dust lead content for hand lead loading in all age groups and for foot lead loading in adult family members. In conclusion, skin lead levels are elevated in family members living in a lead-exposed worker's house and are correlated with the levels of household lead contamination.

SP-141

Comparison between Resident Handling and Workers' Health from Long Term Care Facilities in Central Taiwan

Che-Han Hsu[1], Hui-Chuan Chiang[2], Chien-Lai Chao[1], Yi-Hsiu Lin[1]
1. Central Taiwan University of Science and Technology, Taiwan
2. Fong Yuan Hospital, Taiwan

Objectives: One of the major occupational injuries in LTC facility is the frequent heavy handling and repositioning of residents that exceed the handling capacity of most nurses, nursing aides and orderlies. The purpose of this study is to identify the physically demanding duty for resident handling and movement, and to assess the self-reported occupational injuries among the workers as well as to explore their associations.
Methods: A cross-sectional questionnaire survey was conducted for nurse aides with participants of 204 (response rate 69.7%) from 7 LTC facilities in central Taiwan. The measurement tool contains 4 issues including personal information, resident handling and movement works, physical demanding works and self-reported health.
Results: It was found that transferring residents from chair to bed or bed to chair is the most physically demanding duties for resident handling. The most experience of self-reported injuries is the pain in the neck and shoulder. It is interesting to found that worker's injuries are correlated with the personal characteristics of age, education, number of resident care per day, license the self-reported health status. The most self-reported health problem is found in the item of headache, which includes the variables of age, education, heavy objects movement other than resident handling, license and work shift.
Conclusion: It has demonstrated that the physical demanding works are correlated with the self-reported health status. It has advocated for replacing resident handling and properly releasing workload of nurse aides in order to prevent their injuries.

SP-142

The Relationship between Neighborhood Petrol Station Density and Fetal Cord Blood Manganese in Taiwan

Ying-Ying Lin, Yue-Liang Leon Guo, Pau-Cheng Chen, Jyung-Hung Liu, Yaw-Huei Hwang
National Taiwan University, Taiwan

Methylcyclopentadienyl manganese tricarbonyl (MMT) is widely used as substitute for lead containing anti-knocking additives in gasoline. This study was set to investigate the relationship between the concentration of manganese in cord blood and the density of petrol stations in the neighborhood as a surrogate of traffic density.
Materials and methods: In total, 1526 newborns were sampled by stratum from April, 2004 to July, 2005. Questionnaires were completed by mothers after delivery, which included demographic characteristics, medical history, and living environment. Cord blood samples were collected at birth and analyzed by inductively coupled plasma mass spectrometry. We used petrol station count (PSC) within 3 km buffer zone of the newborns' residence as surrogate for exposure to MMT-containing gasoline, based on 1343 geocoded addresses using the ArcView geographic information system. We correlated cord blood manganese and lead

concentrations with PSC using multiple regression model (SAS 9.1).
Results : The means of cord blood lead and manganese concentration were 14.3 and 49.9 μg/L respectively. Cord blood manganese concentration was significantly associated with PSC (β=0.25; p<0.0001) after adjusting for family income, maternal education, maternal smoking, alcohol drinking during pregnancy, maternal age, child gender, gestational age. No association was found between lead and PSC.
Conclusion: This ecological study found that fetal cord blood concentration was related to neighborhood petrol station density. This finding suggested that exposure to MMT-containing gasoline might have lead to fetal exposure to manganese.

SP-143

Analizing the Factors That Are Related to the Occupational Stress among Nurses within the Overnight Hospitalization Unit of Dr. Tadjuddin Chalid Hospital Makassar 2009

Syamsiar S Russeng*, *Mutmainnah Usman
Occupational Health Department, Indonesia

Objective: WHO stated that stress was an epidemic that was spreading around the world. Based on the results of a survey carried out by PPNI, around 50,9% of nurses in 4 provinces in Indonesia experience occupational stress, the symptoms such as dizziness, tiredness, difficulties in taking a rest which are caused by a large work load, time-consuming jobs, without any sufficient incentive. . The aim of this research is to analyze the relationship among occupational stress with work load, work shift, and type of personality of the workers. The samples of this study are 63 nurses in Dr. Tadjuddin Chalid Hospital, Makassar.
Method: This research uses the method analytical survey with a cross sectional approaching
Result: The result of this study reveals that based on chi square test and creames V test with prosperity level $p \leq 0,05$, variable work load ($p = 0,019$ and $\varphi = 0,355$), work shift ($p = 0,029$ dan $\varphi = 0,334$) are related to occupational stress. On the other hand, work relationship ($p = 0,188$) and type of personality ($p = 0,142$) are not associated with occupational stress.
Conclusion: There is a significant relationship among occupational stress, work shift, and work load. The researchers hope that the involved hospitals carry out the stress management techniques, manage the physical facilities in work areas, and provide workers with entertainment.

SP-144

Concentrations of Phthalates in Cup Water at Various Thermal Conditions

Lih-Ming Yiin*, *Yi-Jie Chen*, *Jia-Ni Tian*, *Chien-Che Hung
Tzu Chi University, Taiwan

Phthalate esters are commonly used for plasticizing in most plastic products, and some of them have been found to be harmful as environmental hormone. To determine how many phthalate esters could be dissolved in sealed plastic cup water in various thermal conditions, we conducted a factorial experiment model using split-plot design. The settings of the experiment were three temperatures (room temperature, 60 °C, 80 °C) and three baking times (2 hours, 4 hours, 8 hours) with three replications. Each water samples was extracted with n-hexane and concentrated to a volume of 0.5 ml for analysis of gas chromatography-mass spectrometry. The preliminary results showed that cup water contained micro amounts of phthalates, such as diethyl phthalate (DEP) and dibutyl phthalate (DBP); the amounts of phthalates, however, increased significantly after the cup water was placed at high temperatures during a certain period of time. Based on the precautionary principles, we suggest that cup water should be placed away from any sources of heat (e.g., sunlight) to reduce the intake of phthalates.

SP-145

The Study of Foundry's Crystalline Free Silica Exposure By Xrd

***Hui-Tzu Huang*[1], *Ching-Tang Kuo*[1], *Shi-Nian Uang*[2], *Shu-Hsien Chiang*[1], *Pei-Tzu Liao*[1]**
1. China Medical University, Taiwan
2. Institute of Occupational Safety and Health, Taiwan

Exposure to crystalline free silica for a long term may damage human respiratory system seriously. Foundry is the basal industry in Taiwan, the dust containing crystalline free silica is produced in the working environment. Environmental monitoring of crystalline free silica is very difficult, due to the analysis is not only complicated but also costly. The main purpose of this project is to explore an inexpernsive alternative analysis with simpler process. First of all, we used the cyclone to test the usability and the uniformity. Second, we tested and took the method of Japanese JIS A1481 X-ray diffractometry. Third, we used the simple resources to build the calibration curve. Finally, we applied this method in the working environment and took this method. The results showed that the aluminum plated had a much better effect in identifying crystalline free silica. The all open-faced samples had good uniformity in the filter no matter how many middle. The calibration curve had a good correlation coefficient (r=0.995). Due to different industrial operating patterns, the industrial environment had the different concentration distribution. The dust consisted of 10- 30% of crystalline free silica in all samples obtained from the foundry environment. The crystalline free silica was accounted for less than 10% in the respirable dust. This simple and low cost method can become to improve the foundry working environment.