categories: managed, labour and repetitive motion types through descriptive statistics and two way ANOVA. Indicate the relationship between the two sets of 8 weeks of physical health intervention program.
Results Stress and lack of sleep were the sources of fatigue. The degree of discomfort in neck and shoulder and low back were related to the level of fatigue. There was a significant decrease in lower limb and back muscle stiffness and an increase in muscle elasticity measurements after physical health promotion program. Managed workers showed muscle tension is greater than the vertical type of labour.
Conclusions A well planned physical health program specifically designed the needs for the workforces can effectively change the perception of fatigue and reduce the level of muscle stiffness. Such promotion model can be further utilised in other occupational worksites.

0248 PREDICTING PHYSICIAN'S DUTY STRESS BY PARASYMPATHETIC NERVOUS FUNCTION (ALSO TO BE CONSIDERED FOR MINI-SYMPOSIUM: EARLY DETECTION AND MANAGEMENT OF WORKERS UNDER STRESS)

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Objectives Early stress markers are useful in detecting workers with occupational stress. The aim of this study was to determine whether heart rate variability was associated with physicians' duty loading, and also a good predictor for stress markers.
Method An observational study on physicians with variable duty loading was conducted in a secondary referral medical centre in northern Taiwan in 2012. For every participant, 24-hr electrocardiography (EKG) and hourly blood pressure were obtained during three test days, i.e., regular-duty (only day shift), moderate-duty (day and night-shift with moderate number of patients cared), and high-duty days (day and night-shift with higher number of patients cared). Blood samples for stress markers were obtained at 8 am on the test day, and 8 am on the second morning.
Results A total of 12 staff physicians satisfactorily completed the study. The number of patients covered at night shift was 0, 92 ± 8, and 187 ± 9, for regular-, moderate-, and high-duty nights, respectively. Total phone calls, urgent procedures, new patients admitted, critical patients cared and times of awakenings were significantly higher as the duty loads increased. The parasympathetic indicator derived from continuous EKG, high frequency normalised unit (HFnu), was negatively related to loading of total patient cared ($P < 0.0001$). Reduced HFnu predicted elevated night systolic blood pressure ($P = 0.016$) and serum uric acid ($P = 0.024$), and 24 h urine vanillylmandelic acid ($P = 0.0045$), dopamine ($P = 0.011$), and norepinephrine ($P = 0.027$).
Conclusions HFnu derived from heart rate variability measurement may predict several important stress markers during night-shift duties.

0249 DETERMINANTS OF OCCUPATIONAL HYGIENE EXPERT JUDGMENT ACCURACY

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Objectives A cross sectional study was performed to determine the applicability and accuracy of expert judgment in occupational exposure assessment. The roles of educational session and determining factors were also realised.
Method Thirteen occupational hygienists were divided into two groups based on their field experience. They asked to evaluate exposure intensity in seven operating units in a tile factory before and after exposure training session. Participant's judgments were compared to actual air sampling data in the factory; and relative errors were calculated. Inter-class correlation coefficients were calculated and relative errors compared according to participants characteristics. Stepwise regressions were performed to investigate the defining variables.
Results In all situations there were almost perfect agreement (ICC >0.80) among raters. Correlations between estimated mean exposure and relative percentage error of participants before and after training were significant at 0.01 (correlation coefficients were -0.462 and -0.443 respectively). Results showed that actual concentration and experience resulted in 22.4% prediction variance for expert error as an independent variable.
Conclusions Correctness of exposure ratings by hygienists was susceptible to error from several sources. It seems that experienced subjects had better ability to predict the exposures. In general, in lower concentrations, the rating error increased significantly. Leading causes of judgment error should be taken into account in epidemiological exposure assessment studies.

0250 OCCUPATIONAL EXPOSURE AND STROKE - A CRITICAL REVIEW OF CHEMICAL AND PHYSICAL EXPOSURES

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Objectives Stroke is the third most common cause of death in developed countries, exceeded only by coronary heart disease and cancer. There is substantial scientific literature on the association between occupational exposures and coronary heart disease, but much less is known about stroke. This systematic critical review was performed to assess the strength of evidence for causal associations between chemical and physical occupational exposures and stroke.
Method Literature on stroke incidence or mortality and occupational factors published up to 2012 was identified from Medline and Scopus. The 4 471 abstracts were evaluated independently by two reviewers. 29 studies relevant to chemical and physical exposures were identified; ionising irradiation (7 studies); carbon disulfide (4), dynamite (3), motor exhaust (7) and other combustions products (8). The evidence for an association was assessed according to defined criteria as strong, moderate, limited, or insufficient.

Results There is strong evidence for an association between high exposure to ionising irradiation and stroke, from studies on patients undergoing therapeutic x-tray treatment and atomic bomb survivors. The evidence for an association with occupational exposure to ionising irradiation is limited. There is moderate evidence for an increased risk among smelter workers, and limited evidence for carbon disulfide. The evidence for dynamite, motor exhaust and other combustion products is insufficient.
Conclusions This review identified limited evidence for an association between several chemical and physical occupational exposures and stroke. The few available studies on smelter workers all showed indications of an increased risk of stroke, and this association needs further investigation.

0252 OCCUPATION AND SURGERY FOR SUBACROMIAL IMPINGEMENT SYNDROME - A NATIONWIDE DANISH COHORT STUDY

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Objectives Little is known about the time window for accumulation of occupational exposures and shoulder disorders. We aimed to evaluate cumulative occupational shoulder exposures as risk factors for surgery for subacromial impingement syndrome (SIS), and to examine how long the relevant exposure time period is.
Method We conducted a nationwide register study of all persons born in Denmark (1933–1977), with at least 5 years of full-time employment (1993–2007). In the follow-up period (2003–2008), first-time events of surgery for SIS were identified. Cumulative exposure estimates for a 10-year period were obtained by linking occupational codes with a job exposure matrix. Exposure estimates were expressed according to the pack-year concept of smoking (e.g. arm-elevation-years). We used logistic regression equivalent to discrete survival analysis with a one year time lag, adjusting for age, sex, region, and calendar year, and compared the ORs for exposure time windows of increasing length.
Results The adjusted OR (ORadjusted) for surgery for SIS reached 2.0 for arm-elevation-years, repetitive-movement-years, and force-years, and the ORadjusted for hand-arm-vibration-years reached 1.5. We found an increase in ORadjusted from 1.0 to 2.1 when expanding the exposure time window from 2 to 10 years back in time.
Conclusions Our findings suggested that upper arm-elevation, repetitive movements, forceful exertions, and hand-arm-vibration were risk factors for surgery for SIS, and indicated a cumulative exposure effect within a 10 year time span.

0254 COMMUTING ACCIDENT IN MALAYSIA: ARE WE DOING ENOUGH?

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Objectives Commuting accidents are accidents occurring while travelling to and from work, and in the course of work. Effort to reducing commuting accidents is important in managing occupational accidents. In Malaysia, the number of claims for commuting accident has showed an increased of 28.3% (17 170 to 22 036) from 2001 to 2010, compared to a decreased in number workplace accident claims by 31.8% (61 163 to 35 603). This increase was despite the total number motor vehicle casualties decreased by 44.0% over the same period. The aim of this study is to review the current efforts on reducing motor vehicle accident.
Method Systematic review of peer review literature, accidents statistics, initiatives and policies related prevention of motor vehicles accidents
Results Review of the statistics showed that most of the commuting accident causalities occurred during travel to and from work (88.5%), during the morning shifts (68.8%) and involving less than five kilometres of travel (55.0%). Motorcycles riders contributed significantly to these causalities. Although motorcycles only accounted for 15.8% of the vehicles involved in accidents, they contributed 49.7% of casualties and 58.7% of the total fatalities. Many initiatives targeted at motorcycles riders were already in place; including mandatory usage of helmet (rider and pillion), compulsory use of daytime headlight, dedicated motorcycle lanes on highways, road safety education in schools and workplace, however the accident rates were still high.
Conclusions A more comprehensive intervention programme targeted at motorcycle riders and the investment on safer public transportation system is needed to reduce commuting accidents.

0258 FACTORS PREDICTING NURSES' CONSIDERATION OF LEAVING JOB (ALSO TO BE CONSIDERED FOR MINI-SYMPOSIUM: EARLY DETECTION AND MANAGEMENT OF WORKERS UNDER STRESS)

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Objectives Nursing manpower shortage has long been a problem in the healthcare system in Taiwan. The main cause of this problem has been nurses' lacking of willingness to retain in job. This study aims to identify factors for nurses' consideration of leaving their job.
Method Study participants included female nurses from a nation-wide representative sample of accredited tertiary and secondary referral hospitals, selected using stratified random sampling. To candidate participants, a structured, self-administered questionnaire was distributed, which included demographic information, description of work conditions, the Chinese Job Content Questionnaire, and the modified Chinese Copenhagen Burnout Inventory. Consideration of leaving job is defined by "having ideation of leaving job weekly or more frequent" and the estimation of not working as a nurse in two years.
Results A total of 1031 female nurses completed the questionnaire satisfactorily. Among them 16.7% considered leaving job. Personal burnout, client-related burnout, and conflict with family needs predict consideration of leaving job. While inquired what work factors were important for their making decision of leaving job, overtime work was listed number one, followed by shift