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APPLIED OCCUPATIONAL HEALTH AND SAFETY ASSESSMENT SYSTEM (OHSAS18001) FOR HEALTH RISK ASSESSMENT OF WORKERS AT GASOLINE STATIONS

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Introduction Working in areas where benzene (human carcinogen) is contaminated in the environment is considered a risky operation. The previous research at gasoline stations found that refuelling workers had occupational exposure to benzene. However, quantitative exposure assessment to benzene has been mostly pointed for cancer. If look at the level of opportunity to be exposed to benzene, there need to be considered other factors, such as compliance with work instructions, PPE use, equipment standards and OHSAS18001 is a good guideline on risk assessment accounting these principles. This study aimed to quantify the risk level using the OHSAS 18001 model of risk assessment in fueling and cashier workers and the located different stations of urban, sub-urban and rural area.

Methods A study was conducted at gasoline stations in different zones of Khon Kaen province, Thailand. There were 237 refuelling workers and 25 cashier workers included into this study for data collection via subject interviews using a structural questionnaire, observations and information of exposure levels of benzene. Risk assessment matrix from applied OHSAS18001 (opportunity x severity) was suitable performed.

Results Majority of refuelling and cashier workers were at moderate exposure to benzene (64.98% and 72.00%), and most areas found that to the moderate exposure was in the sub-urban zone (75.74%), followed by urban (57.14%), and rural zone (51.02%). The health risk of fueling and cashier workers on benzene exposure was rising to be the high level. Considering location of gasoline, the high risk level was predominantly found in sub-urban area.

Conclusions This applied OHSAS18001 matrix showed that workers are at high risk of exposure to benzene at gasoline station which confirms the previous report of the highest concentration of benzene in sub-urban area. There should be the preventive measure among these workers following risk levels and occupational risk assessment should be included.

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WORKING WITH ENGINEERED NANOMATERIALS: WHAT'S THE OCCUPATIONAL PHYSICIAN'S ROLE?

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Introduction Nano-electronics has a huge potential for society. Some nano-electronics productional processes use nanomaterial in various forms. However, the knowledge about occupational health surveillance for employees working with nanomaterials does not seem to follow the rapid pace of innovation. Therefore, NanoStreeM, a European Consortium, sheds light on medical follow-up in nano-workers with the semiconductor industry as an example.

Methods A survey about the current practices of medical supervision of persons handling nanomaterials has been conducted in 6 international semiconductor industrial companies.

A literature search for existing guidelines, reports and articles about occupational exposure and medical surveillance concerning all sorts of nanomaterials was performed.

Results Survey: Registration of employees working with nanomaterials takes place in only one company. Because of differences in legal requirements per country and the fact that nano-workers are mostly followed for exposure to chemical risks rather than for nano-materials, medical follow-up is not well established. Clinical examination and spirometry, blood analysis and urine biomonitoring, X-ray and ECG are respectively performed in three, two and one company.

Search: 15 guidelines/reports and 18 articles could be retained. All were published between 2008 and 2016. Generally they state that there is insufficient evidence for nanospecific surveillance, however exposure registries and general medical surveillance as early warning system are recommended. Medical screening for now is only recommend for:

- Carbon nanotubes and nanofibers by means of spirometry and baseline X-Ray
- Nanomaterial composed of a compound that is already subject to medical screening

Discussion General medical surveillance and exposure registries of nano-workers are advised, yet not always performed. Medical screening is necessary for carbon nanotubes and nanofibers or nanomaterial of which working with the bulk material requires screening. Experimental studies are needed to establish suitable biomarkers. Besides epidemiological studies are necessary in order to specify the recommendations for occupational health physicians.

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THE IMPACT OF ACID MIST ON DENTAL HEALTH IN ELECTROPLATING WORKERS

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Introduction The oral cavity is one of the first place to expose to occupational hazards in work environments, such as inorganic acid mist. There was few researches concerning the relationship between dental disorders and occupational hazards. The aim of this study was to determine the association of acid mist exposure with periodontal status and dental caries.

Methods The study population of 304 workers was recruited from four factories in Taiwan (151 acid mist exposed workers and 153 controls). Personal, medical and occupational history were collected by interviews and questionnaire. Dental status was examined by well-trained dentists and using Decayed-missing-filled-teeth (DMFT), Community Periodontal Index of Treatment Needs (CPITN) and Loss of attachment (LA) as indices of dental health.

Result Of the acid mist exposed group, 95.4% and 57.5% had high CPITN scores and LA scores, and 87.6% and 40.5%

for the referent group ($p=0.015$ and 0.003). For CPITN and LA scores, the adjusted odds ratio for acid mist exposed group were 2.80 (95% CI: 1.00 to 7.88; $p=0.05$) and 2.85 (95% CI: 1.54 to 5.28; $p=0.001$). However, DMFT scores and dental erosion were not associated with the exposure to acid mist, even after control for age, duration of work, smoking habits, drinking habits and betel nut chewing habits.

Discussion The findings suggest that the workers exposed to acid mist from electroplating would increase the risk of periodontal disease. Further work environmental design or equipment reform are still needed to protect from acid mist exposure.

532 SHEDDING A LIGHT ON GREY LITERATURE SEARCHES FOR OCCUPATIONAL HEALTH TOPICS: A BELGIAN CASE STUDY ON CHEMICALS EXPOSURE

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Introduction For occupational health topics with hardly any published white literature available, grey literature can be a generous information source. This abstract describes the search and use of grey literature in preparation of the PROBE (Hazardous chemical Products Register for Occupational use in Belgium) study, aiming to map both occupational exposure to chemicals in Belgian workers and the need for knowledge about such exposure.

Methods A cascade of methods was applied. First, relevant associations, organisations, agencies and bodies were identified through interviews with field experts and general internet search engines. Then, specific domains within Google Advanced Search were applied to geographically limit the results to Europe and Belgium. As quality filters, the domain limits org, edu and gov were applied. A second approach consisted in specific grey literature gateways. Finally, references in retrieved documents were explored for additional information sources.

Results This multifaceted approach generated a comprehensive overview of evidence based data. The compiled information can be categorised as databases with exposure data and chemical risk assessments, data from similar research in other countries, methodological insights in chemicals selection and exposure surveillance techniques, interim reports of ongoing research, reports, white papers, and legislation.

The pathway of grey literature databases was abandoned, as its literature was outdated.

The retrieved information provided us with the necessary acumen in the selection of relevant chemicals and appropriate assessment strategies to strengthen the proposed study protocol.

Discussion A grey literature search is a challenging and lengthy process as the information is dispersed, hard to access and fragmented. The standard review methods for white literature do not apply to grey literature searches. The complex

architecture of grey literature requires an innovative, creative and iterative approach. Nevertheless we succeeded in tapping valuable information from this source. Further initiative is needed to improve grey information availability and retrieval.

568 AN ASSESSMENT OF PERCEPTIONS AND KNOWLEDGE OF CHEMICAL HAZARDS IN THE MOTOR SPRAY PAINTING INDUSTRY IN BULAWAYO

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Introduction The motor vehicle repair industry with particular focus on spray painting in Bulawayo has grown especially after dollarization in 2009, owing to the increasing number of vehicles in the city. The industry is made up of both the formal and informal repairers with the informal sector registering the largest growth compared to their formal counterparts due to the low prices they charge. This industry has not been spared either from the occupational safety and health scourge that continues to haunt the Zimbabwean economy.

Methods A descriptive and cross sectional study of companies in both the formal and informal sector was carried out. Twenty five factories were visited and twenty five spray painters were interviewed. The research combined the use of observations guided by a checklist and a questionnaire administered to employees in this sector to collect data.

Result 96% of the employees interviewed are in the 21–40 age groups, were predominantly male, with very few females found in the workshops. There is generally a high exposure to chemicals which the employees are fully aware of but PPE/C use was low during the spraying process. The spraying process in the informal sector is done in the open while in the formal sector, booths maybe available ventilation and chemical exposure design are a cause of concern. The majority of workers have general awareness on the manifestation of health effects stemming from their work but do not have an understanding of how these could affect their health.

Conclusion Lack of chemical safety education in these organisations is a major factor contributing to the continued exposure to chemicals in the workplace. Mandatory training for initial certification to operate and work a spray painting workshop and refresher training after a certain period of time for example every two years by the government is therefore recommended.

679 SEIRICH: A TOOL FOR THE ASSESSMENT OF CHEMICALS IN OCCUPATIONAL ENVIRONMENTS

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Uses of Chemicals placed on the European market within the framework of the REACH regulation require in the end a field assessment according to the provisions of the French Labour Code. Numerous methods exist for assessing chemical risks in the work environment in France, taking into account risks to health, fire, explosion and environment. These