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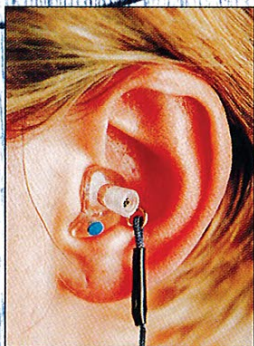
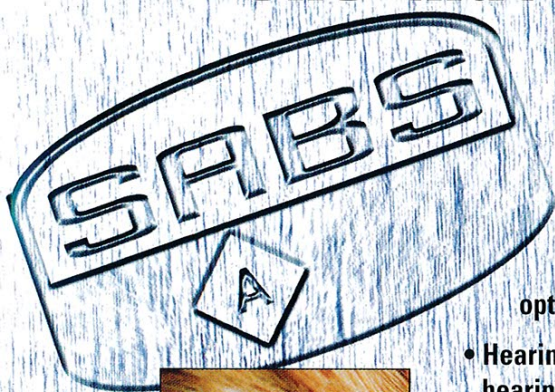
Vol 6 No 2 March/April 2000

ISSN 1024-6274



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Mar/Apr 2000
Volume 6 No 2

This journal focuses on Occupational Health, Medicine, Hygiene and Safety, Primary Health Care at the workplace, Environmental Health and other employee health benefits

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A CANNON MEDICAL MEDIA PUBLICATION

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Occupational HEALTH

SOUTHERN AFRICA

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Aspects of continuing professional development (CPD)

The journal was accredited towards the end of 1999 and the first questionnaire was sent out with the Nov/Dec issue. These questionnaires need to be returned to the SASOM office where they are sent for electronic marking and doctors are awarded 3 CPD points if they obtain 60% or above. At the end of each year a certificate will be sent to each participant with the number of points obtained. However it is not common knowledge that authors also receive CPD points for articles that are published in the journal. The number of points that can be awarded varies from 15 to 2 depending on the number of authors and the type of article. Once the article has been published, the SASOM office will send the author(s) a certificate containing their CPD points. It is sincerely hoped that this will be an inducement for doctors to submit articles in a variety of categories which include original and review articles as well as reports, opinions and case studies.

As part of maintaining its accreditation, certain statistics and reports must be sent to SAMA on an annual basis and readers will be kept updated of our progress. In the meantime, keep on filling in those questionnaires and continue to put pen to paper.

Bitumens and Coal-tar derivatives

Esterhuizen has written a very useful review on bitumens and coal-tar derivatives which are quite widely used in certain industries. We often lump these together, but there are significant differences between them which are clearly shown. It would be of interest to know how many people have been compensated under COIDA for problems developed from these chemicals.

Ergonomics

There is no doubt that the whole science of ergonomics in SA remains a cinderella discipline and that it really only exists on the fringes in industry. It is however a very important component, not only in improving productivity and quality, but also in preventing occupational diseases and injuries. Repetitive strain injuries are seldom reported in this country, but are certainly occurring.

Van der Merwe explores this whole issue and concurs that ergonomics should have a much higher profile.

Air monitoring

With the gazetting of the Hazardous Chemical Substances Regulations, air monitoring has become a requirement and forms part of the whole risk assessment process. It is not a simple task and readings obtained must be accurate and repeatable as important decisions are made on the results of these measurements. Harmse describes the requirements of the regulation and how to go about air monitoring.

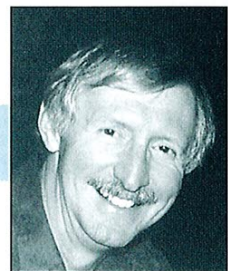
Headaches

Shevel has turned a very complicated subject into a relatively simple one. Headache is a frequently experienced symptom, but the cause is seldom established. He has proposed a practical classification and guidelines for investigation and treatment.

Past articles in Occupational Health Southern Africa

The publishers Cannon Medical Media receive several requests each month for past articles. As the journal has now been in existence for 5 years it is often difficult to access these. As a result Cannon has now included all past articles on their website (www.cmmaccess.co.za) by author, title of the article and by volume. Discussions are also underway to link this into the ASOSH website as well. The publishers are to be congratulated on this initiative which has been a considerable amount of work. It will make their task simpler when they get requests and individuals may also access the information directly through Cannon's website. This is explained in more detail later in this issue.

Mike Baker
HONORARY EDITOR



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World Aids Day 1999

“Let us join hands in partnership against HIV/AIDS, fully aware that our unity is our strength. Let us pledge that wherever we meet and study, wherever we work and sing, play or enjoy one another’s company, that we will protect ourselves and our partners against HIV/AIDS.” President Thabo Mbeki.

The implications of sick leave for HIV positive employees is already starting to hit South African business as figures rise to 1700 new HIV infections every day. The only sure thing about AIDS in SA is that the worst is yet to come. The average age of those infected is 41,5 years.

As a company, Corobrik realised many years ago that time is of the essence with such a quick-spreading disease. In order to face the challenge of being effective against AIDS the company needed to be passionate in its fight

against the disease. They needed to listen, learn and live AIDS. To manage this effectively, behaviour changes had to be instituted, an atmosphere of trust, goodwill and compassion had to be nurtured and its mission has been to empower its employees with the knowledge that AIDS is about living, not dying.

Part of the awareness and educational campaign has been to recognise World Aids day each year and to spread awareness to all surrounding companies, as corporate activists in the ongoing struggle.

The theme in 1999 was “Youth - a force for change”. Many caring organisations were invited to join in as exhibitors for the day, including Cotlands Home, Bethesda House (the Salvation Army refuge for AIDS babies), St Francis House, Mahau Centre Kalafong, and others.

Father Barry Hughes-Gibbs was the inspiring guest speaker, encouraging everyone not to give up the fight.

Choirs from Watville lead in hymns and prayers through the day. Corobrik’s own talented “Four tenors” sang a moving AIDS prayer. Candles were lit in memory of those who have died and red ribbons pinned to the AIDS Xmas tree to encourage those still struggling, to come to terms with the devastating effects of the disease.

Visitors were encouraged to write names on a large sheet in memory of lost loved ones. Hands were clasped and many tears were shed. A short, moving ceremony took place when the memorial plaque for Eustacia Msibi, Corobrik’s former loyal peer group educator, was unveiled.

Over 1000 people took part in the proceedings - including neighbouring



World Aids Day celebrations at Corobrik

company staff, and medical staff who are in contact with Corobrik’s workers.

Each employee was presented with a beaded AIDS badge as a personal commitment in the fight. This is meant to be a symbol of empathy for all patients and their families.

Sister Bev Hoggins, Corobrik, Edenvale



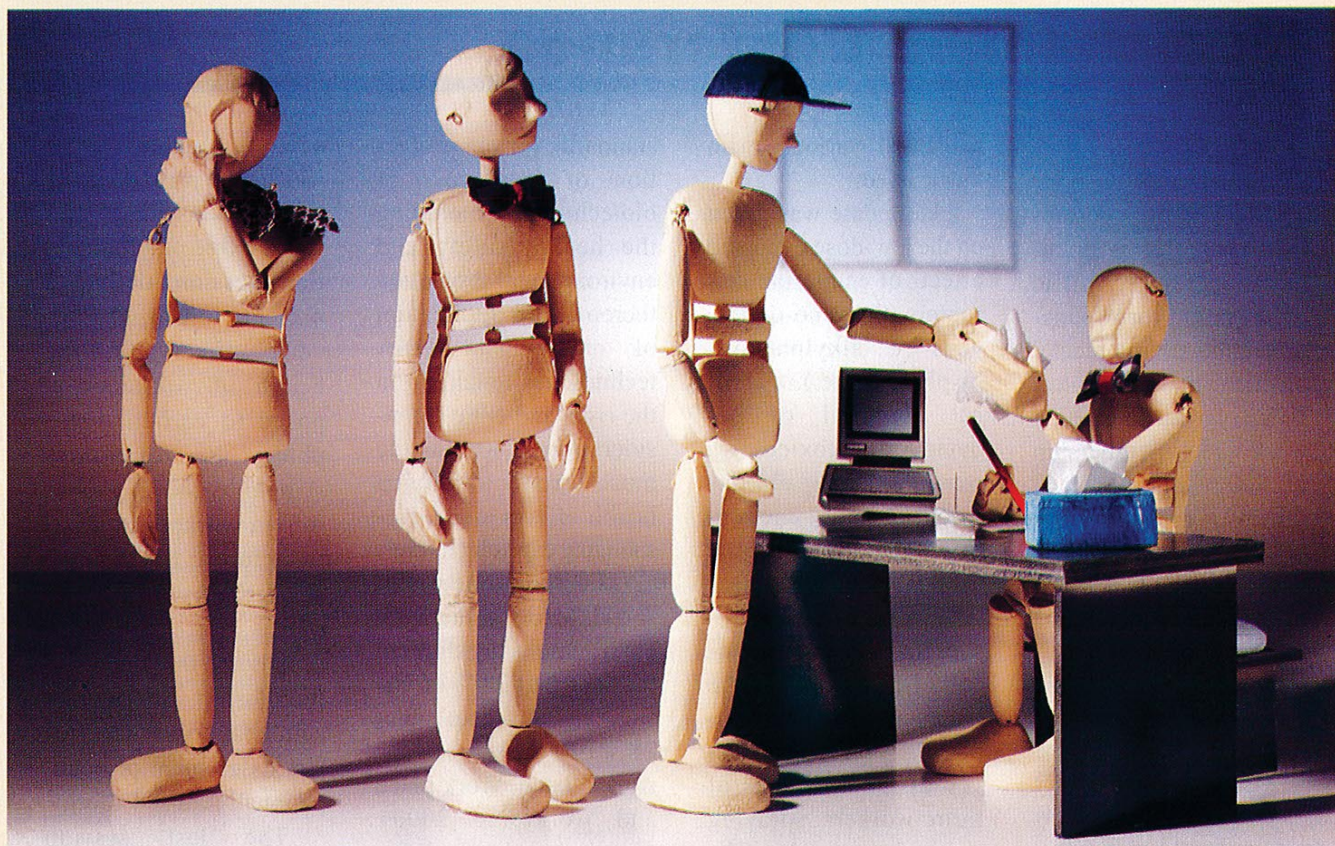
Above: Some of the honorary life members attending the Sasohn AGM and banquet in Stellenbosch are, from left: Delene Lorimer (Chairlady Western Cape) Louvna Pretorius (Sasohn president), Beverley Knights, Guillea Reynders, Stan Daniels, Fransie Smit, Eliza Snyman and Jenny Serfontein.

SASOHN News

Below: The Pretoria Professional Society of OHN practitioners ended 1999 with a feast. Committee members who attended are, from left: Corrine du Toit, Heidie Bezuidenhout, Louvna Pretorius, Alta Kritzinger, Celeste Diederichs (chairlady), Alma Schultz, Tirsia Barnard, Amanda and Martin Lazenby.



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For further information contact 080000 4578

Ref: 1. L Leighton et al. Sickness absence following a campaign of vaccination against influenza in the workplace.
Occup. Med. Vol 46, No. 2 pp 146 - 150

 PASTEUR MÉRIEUX CONNAUGHT
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Society for AIDS care

"Southern Africa is host to one of the fastest-growing HIV epidemics in the world. Infected and at-risk individuals, health care funders and policy-makers have finally begun to wake up to this reality and urgently require a competent base of clinical practitioners to manage the epidemic through providing cost-effective, quality care," according to Dr Des Martin, president elect of the Southern African HIV Clinicians Society.

The Society is a national network of accredited medical practitioners committed to quality HIV care, providing medical care and clinical interventions based on peer and internationally reviewed clinical guidelines. It is linked to clinical trials and academic research programmes and able to provide access to a regularly updated provider information database.

Its objectives include the accreditation and support of the network of

providers, as well as facilitating clinical research, drug and vaccine trials. The society also provides links on an international basis.

More information and membership applications can be obtained from (011) 453-5059



AIDS HELPLINE
☎ 0800-012-322

SASOM/SASOHN joint conference

Sasom and Sasohn will join hands by hosting a historic first-ever joint conference in November 2000.

It will be named "Egoli 2000" and medical practitioners, occupational health practitioners and management is sure to benefit from the

information supplied by intended topics such as "Benchmarking between ISO 14000 and ISO 18000", "tropical infections and diseases", employment equity and environmental issues as ISO 14000 and 18000", and "ergonomics and stress in the workplace".

Guideline available

The long-awaited guideline "Medical requirements for Fitness to Drive" saw the light and Sasom thanks Drs Murray Coombs and Beau Dees for their dedication and efforts, as well as the Sasom Scientific Committee for Transport,

which produced the final document. The document is available as a single-binded document or can be included in the Sasom Ramazzini guidelines. **Contact Dehliia Muller at the Sasom national office on (012) 667-5160 for more information.**

Support for Gauteng health

Leading pharmaceutical company Glaxo Wellcome SA is assisting the Gauteng Department of Health in the establishment of five support centres, among which is the Tshepo Support Centre in Leratong, which was officially opened in November 1999.

These support centres represent an unique multi-team endeavour to address SA's appalling rate of violence and crime. The departments of Health, Welfare, Education, Justice and Safety and Security, as well as the Police and Medico-Legal Services - are working together. The aim is to ensure that all the services and trained personnel required to treat and assist survivors of violence in a sympathetic but efficient manner will be available on a 24-hour basis at one convenient location in each Gauteng district.

"It is essential that all

evidence be gathered in such a manner as to be admissible in court," says Dr Frew Benson, director of Medico-Legal services, Gauteng. "We want to make sure that criminals do not escape conviction because of mishandling the initial examination and information-gathering. This is where staff training comes in."

Glaxo Wellcome is sponsoring the refurbishment of these support centres to make them a safe and comforting haven for survivors of violence. In addition to providing assistance immediately after incidents of violence, these centres are also meant to empower local residents to be more proactive in dealing with violence in the home and community.

Among the other support centres around Gauteng are those at Hillbrow hospital, as well as the Chris Hani Baragwanath and Natal-spruit hospitals.

What is flu costing you due to absenteeism and reduced productivity?



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1 Which is correct? The quality of life scores of migraine sufferers are similar to those of people with:

- A - Meningitis
B - Diabetes
C - Congestive cardiac failure
D - Asthma
E - none of the above

2 Indicate the right answer: The treatment of choice in primary headaches associated with muscle tension (MI, TTH, CDH) is:

- A - Muscle relaxants
B - Intra-oral appliance
C - Tricyclic antidepressants
D - Bed rest
E - Tryptans

3 Choose the correct answer: One of the following is usually not associated with migraine:

- A - Throbbing pain
B - Photophobia
C - Bilateral pain
D - Phonophobia
E - Nausea

4 Which is correct: According to Von Korff, work effectiveness during a headache attack is reduced by an average of:

- A - 2%
B - 7%
C - 12%
D - 41%
E - none of the above

5 Indicate the right answer: Analgesic abuse causes the following type of headache:

- A - Migraine
B - Tension-type headache
C - Combinations of migraine and tension-type headache
D - Secondary headaches
E - None of the above

6 In which of the following industries or work processes does bitumen fume exposure normally not occur?

- A - Roofing
B - Hydraulics
C - Steel mills
D - aluminium smelting
E - all of the above

7 True or False : In epidemiological studies, the main problem with establishing a causal relationship between bitumen fume exposure and cancer has been inadequate control of the confounding effect of exposure to other carcinogens.

- A - True
B - False

8 True or False: The IARC has classified extracts of steam and air-refined bitumens as carcinogenic to humans

- A - True
B - False

9 Indicate whether true or false: The IARC has classified coal-tars and pitches as carcinogenic to humans.

- A - True
B - False

10 Which of the following cancer sites is not listed as compensable under the COID Act, 1993 for workers occupationally exposed to coal-tar, pitch, asphalt, bitumen or volatiles thereof?

- A - Bladder
B - Larynx
C - Nasal cavity
D - Lung
E - All of the above

11 Which answer is correct? Air monitoring for Hazardous Chemical Substances are required in terms of:

- A - The Occupational Health and Safety Act
B - The Lead Regulations
C - Regulation 6 of the Hazardous Chemical Substances Regulations
D - Regulation 5 of the Hazardous Chemical Substances Regulations
E - All of the above

12 Which is correct? Who are legally entitled to conduct air monitoring?

- A - An inspector of the department of Labour
B - An occupational health nurse
C - Occupational hygienists
D - Approved inspection authorities for occupational hygiene
E - Any of the above

13 Indicate the correct answer: Air monitoring should be planned:

- A - in consultation with health and safety representatives
B - In accordance with NIOSH OESSM 27492
C - In accordance with EH 42
D - All of the above
E - A and B

14 Which answer is correct? Occupational exposure limits:

- A - Control limit substances are the same as recommended limit substances
B - Recommended limits are usually set at a point where there is a residual risk to worker health
C - Control limit substances should (under normal working conditions) never be exceeded
D - Respirators may be worn (under normal working conditions) in areas where workers are exposed to control limit substances

15 Which is correct? Air monitoring sample selection:

- A - select the most exposed worker
B - select randomly from a homogenous exposure group
C - select the sample over any period of time
D - select the sample in accordance with the sample methodology
E - A and D

16 Choose the right answer. What is ergonomics?

- A - an aspect of work study
B - fitting the man to the task
C - fitting the task to the man
D - an aspect of occupational therapy
E - applying biokinetics to the workplace

17 Which answer is the correct one? What does anthropometrics entail?

- A - the evolution of man
B - measurement of the human body
C - foot injuries in the workplace
D - the relationship between man and his environment
E - the relationship between man and his work

18 Which of the following are not directly related to ergonomics?

- A - workplace design
B - workstations and seating
C - biological monitoring
D - environmental noise
E - occupational health

19 Who is a very appropriate person to carry out an ergonomics survey within a company?

- A - the health and safety officer
B - the human resources manager
C - the external ergonomics specialist
D - an occupational health practitioner
E - the production engineer

20 Identify the medical condition which can not be caused by poor workplace ergonomics?

- A - myositis
B - osteomyelitis
C - arthritis
D - tenosynovitis
E - sciatica

Instructions

1. Read the articles in the journal to find the answers to the questions.
2. Make sure that your name and address details are correctly filled in.
3. Clearly indicate the edition of the journal.
4. Answer questions by ticking correct answers with an "x" in the appropriate box. Use a black pen and do not mark more than one answer.
5. Keep a copy for your records.
6. Post the completed form to: CPD Points (Occupational Health SA)
PO Box 16179, Lyttleton, 0140. Please do not register the envelope.
7. All completed forms must be posted - not faxed.
8. Answers are recorded by SASOM and a certificate will be issued in due course.

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A review of the occupational health hazards associated with bitumens and coal-tar derivatives

Tonya Esterhuizen

*National Centre for Occupational Health,
Johannesburg*

Occupational Health SA 2000; Vol 6, No. 2: 10 - 13

Epidemiologic evidence of health effects due to occupational exposure to bitumens and coal-tars is reviewed. These substances are complex mixtures containing carcinogenic polycyclic aromatic hydrocarbons, with many industrial applications. Evidence of a causal relationship between bitumen fumes and cancer is inconclusive, due to the confounding effect of exposures to other carcinogens. Coal-tar and pitch were classified as carcinogenic to humans by the International Agency for Research on Cancer (IARC) and was supported by subsequent epidemiological evidence, especially in cancers of the lung and bladder. Less frequently, nonmalignant respiratory and skin diseases have been reported following inhalation or contact with bitumen or coal-tar.

Introduction

The relationship between certain occupations and cancer was first recognised in the 18th century, with reports of scrotal cancer in chimney sweeps.¹ The finding of an association between cancer and polycyclic aromatic hydrocarbons (PAHs), confirmed by

large epidemiological studies, and experimental animal studies, has led to a growing concern for the health of workers exposed to coal-tar products and bitumen. These workers have become the subjects of an increasing number of epidemiological studies.^{2,3,4,5,6,7}

This article outlines the potential hazards of bitumen and coal-tar derived products, with particular emphasis on cancer, by reviewing epidemiological evidence from the main industries where high levels of PAH exposure may be encountered. These industries include roofing, highway maintenance, aluminium and coke production. Iron and steel foundries are not considered in this review, since foundry workers are probably exposed to various known or suspected carcinogens, including PAHs, chromium and nickel fumes, nitrosamines and silica dust.

Background

Bitumens

Bitumens are viscous black or brown liquids or solids. They are refinery products obtained from petroleum by vacuum distillation and are complex mixtures of heavy hydrocarbons, saturates, asphaltenes and resins. Relatively small amounts of PAHs, for example benzo[*a*]pyrene (BaP), are present, and are found mainly in the fumes generated from heated bitumen.

Bitumens possess waterproofing and adhesive properties. Their predominant use is in road construction and maintenance, but it is also used in roofing, hydraulics (for example, dams and reservoirs) and flooring. In road applications, bitumen is either mixed with mineral aggregates to form asphalt, or used as a surface treatment to maintain damaged roads. Bitumen exposure can also occur in sheet metal work, blast furnaces and steel mills.

Coal-tar and derived products

Coal-tars are black viscous liquids or semisolids, with a distinctive naphthalene-like odour. Crude coal-tars are byproducts of the destructive distillation (carbonisation or coking) of coal, and generally contain higher quantities of PAHs, including BaP, than bitumens.

In the industrial setting most of the crude coal-tar produced is distilled, although it is also used as a fuel in the steel industry. Many products are derived from fractional distillation of crude coal-tar, including naphthalene oils, creosote oils and pitch. The distillate fractions are blended further to produce, for example, creosote, naphthalene and road tars.

An important use of pitch is as a binder for aluminium smelting electrodes. Previously it was also used in roofing and asphalt.

Cancers

The IARC has reviewed the evidence from epidemiologic and experimental animal studies to evaluate the carcinogenicity of polynuclear aromatic compounds in workers exposed to bitumen, coal-tar and derived products and workers in aluminium production, coal gasification, coke production, and iron and steel founding.^{8,9} These are summarised in *Table I*.

Table I. Summary of IARC evaluations for the carcinogenic risk of bitumens and coal-tars and derived products^{8,9}

Substance or exposure	Animal Studies	Epidemiologic studies	
		Evaluation	Cancer sites
bitumens	sufficient evidence (extracts of steam- and air-refined bitumens only)	inadequate evidence	scrotum, skin, lung, respiratory system
coal-tars	sufficient evidence	sufficient evidence	skin
coal-tar pitch	sufficient evidence	sufficient evidence	scrotum, skin
creosotes	sufficient evidence	limited evidence	scrotum
coal-tar pitch volatiles from aluminium production	sufficient evidence	limited evidence inadequate evidence	lung, bladder pancreas, hematolymphopoietic system
coal-tar from coal gasification	sufficient evidence	sufficient evidence limited evidence	skin, lung bladder
coal-tar fumes in coke production	sufficient evidence	sufficient evidence limited evidence inadequate evidence	lung kidney intestine, pancreas
coal-tar exposure from iron and steel founding	sufficient evidence	limited evidence inadequate evidence	lung digestive system, genito-urinary system

Bitumens

The IARC has classified extracts of steam and air-refined bitumens as possibly carcinogenic to humans (overall evaluation 2B).¹⁰ Earlier attempts to demonstrate carcinogenicity of bitumen fumes have been complicated by exposure of workers to coal-tar. One study which attempted to address the relationship between cancer and bitumen exposure only, was in a Danish cohort working with mastic asphalt, which normally contains no coal-tar.¹¹ Increased risk for all cancers (standardised morbidity ratio, SMR 195, 95% CI 153-244), as well as cancers of the respiratory system (SMR 347, 95% CI 236-493) and digestive organs (SMR 227, 95% CI 142-344) was reported. However, this study did not control for confounding factors such as smoking and dietary habits. Also, coal-tar may have been added to the mastic asphalt during World War II, when there was a shortage of bitumen.

Genotoxic effects of bitumen exposure, determined by the extent of strand breaks and alkali-labile sites in the DNA of peripheral mononuclear blood cells, were significant in roofers, and higher at the end

of the week, suggesting an occupational origin. Road pavers and bitumen painters showed only suggestive evidence of a genotoxic effect.¹² Although this study controlled for smoking, it was not possible to conclude that the effects were due to bitumen alone. Using other markers for genotoxic effects, a recent study reported that, although nonsmoking road pavers were exposed to increased levels of PAHs from bitumen fumes, no genotoxic effects were detected.¹³

A meta-analysis of epidemiological studies has attempted to quantify the risk of cancer in highway maintenance workers and roofers exposed to bitumen.¹⁰ Among roofers, increased risks for cancers of the lung (relative risk, RR 1.8, 95% CI 1.5-2.1), stomach (RR 1.7, 95% CI 1.1-2.5), skin (RR 4.0, 95% CI 0.8-12), as well as leukaemia (RR 1.7, 95% CI 0.9-2.9) were found from the aggregated results. The highway maintenance workers showed lower aggregated relative risks than roofers.

The authors concluded that the available data was limited, and did not address only the risk from bitumen.

In these settings, workers can be exposed to coal-tar, asbestos, silica dust, tobacco smoke, motor engine exhaust and ultra-violet radiation. The problem of these confounding effects was addressed in 1993, when IARC conducted a feasibility study to assess the carcinogenic effects of bitumen fume exposure in a cohort of road pavers and asphalt workers. They concluded that coal-tar exposure would be an important confounder, and the sample size of workers not exposed to tar would be small.¹⁴

Coal-tar and derived products

The IARC has classified coal-tars and pitches as carcinogenic to humans (overall evaluation 1).¹⁰ Many epidemiological studies have since confirmed this association. Studies of exposure to coal-tar pitch volatiles during the Soderberg process of aluminium reduction have previously shown elevated risks of bladder, lung, pancreatic, and lymphatic cancers. A retrospective mortality and cancer incidence study in a cohort of aluminium reduction plant workers in British Columbia showed significantly elevated rates for bladder cancer

incidence (standardised incidence ratio, SIR 1.69, 95% CI 1.06-2.57) and brain cancer mortality (standardised mortality ratio, SMR 2.17, 95% CI 1.18-3.68).

Bladder cancer incidence was found to increase with lifetime exposure to coal-tar pitch volatiles, and was independent of smoking habits. Lung cancer risk was not elevated in this study.¹⁵ A further cohort study of workers in Soderberg potrooms in Quebec showed an excess of lung cancer in jobs with high exposure to coal-tar pitch volatiles, which was not due to smoking (rate ratio 2.25, 95% CI 1.50-3.38).¹⁶ In the same cohort, a case-control study showed an elevated risk of developing bladder cancer in smokers (odds ratio, OR 2.63, 95% CI 1.29-5.37) and after controlling for smoking, the risk increased as cumulative exposure to BaP increased. The authors noted that although BaP exposure was a good indicator of bladder cancer risk in aluminium workers, the causal agent was not definitely established.¹⁷

Cohort studies have shown increased mortality from cancers in coke oven workers. In the Netherlands, a retrospective cohort study was carried out to investigate the cancer risk for coke oven gas exposed workers. Total mortality of the cohort was significantly elevated (SMR 118.7, 95% CI 106.5-127.0). Mortality from all cancers (SMR 123), as well as from cancers of the respiratory tract (SMR 133.9, 95% CI 103.7-170.6), and liver (SMR 307, 95% CI 132.2-604.9) was also significantly increased.¹⁸ Their results are consistent with those from a more recent study of a cohort of coke oven workers in the USA. Occupational exposure to coke oven emissions was associated with excess mortality from all cancers (relative risk, RR 1.34, 95% CI 1.19-1.50), respiratory (RR 1.98, 95% CI 1.55-2.25) and prostate cancer (RR 1.57, 95% CI 1.09-2.30). An exposure-response relationship was also demonstrated.¹⁹ A disadvantage of both these studies is that smoking habits were not recorded. However, the authors motivated that controlling for smoking probably would not have influenced the results significantly.

In a case-control study in China, excess risk for cancers of the lung (OR 3.4, 95% CI 1.4-8.5) and stomach (OR 5.4, 95% CI 1.8-16.0) was found in coke oven workers.²⁰ A dose-response gradient for BaP exposure was reported. Occupational exposure to pitch was significantly related to prostate cancer in a case-control study in Serbia (OR 2.13, 95% CI 1.05-4.32),²¹ however, a large case-control study in Canada revealed that industries involving coal-tar were not a significant risk for prostate cancer (OR 1.14, 95% CI 0.73-1.78).^{21, 22}

Other health hazards

Bitumens

Although the main emphasis in studies of workers exposed to bitumen has been on cancer, other health effects have been noted. Bitumen fumes have been associated with respiratory disease since 1950.²³ In a cohort study of mastic asphalt workers, increased mortality from bronchitis, emphysema and asthma (SMR 207, 95% CI 95-393) lead the author to postulate that toxic substances in bitumen fumes caused an increased risk of chronic respiratory disease.²⁴ A single case of pneumoconiosis as a result of bitumen fume exposure has been reported to SORDSA (Surveillance of Work-Related and Occupational Respiratory Diseases in South Africa) from the road construction industry.

Skin contact with bitumen and asphalt has also been linked with irritant and allergic contact dermatitis. In a cross-sectional survey of roofers and road pavers exposed to bitumens, 44% of roofers and 31% of road pavers reported skin symptoms, including hot bitumen burns, which were related to bitumen products as well as other exposures.²⁵ Some components of bitumen, such as anthracene and phenanthrene, are potent photosensitisers. An outbreak of bitumen induced phototoxicity has been reported in dockyard employees.²⁶

Coal-tar and derived products

In many of the industries in which coal-tar or its derived products are used, workers are exposed to a variety of toxic substances. For example, in aluminium smelting, pot emissions containing fluorides and sulphur dioxide have been linked to chronic obstructive lung disease and asthma. Few studies on non-malignant health effects related specifically to coal-tar and its derived products were found. Artherosclerosis mortality was significantly associated with cumulative exposure to tar and in a cohort of aluminium smelters.²⁷ In a Dutch cohort of coke oven gas exposed workers, mortality from nonmalignant respiratory diseases was elevated (SMR 166, 95% CI 123.4-217.7), which was 60% higher than in the general population.¹⁸

South Africa

The Regulations for Hazardous Chemical Substances, under the Occupational Health and Safety Act, 1993, recommend occupational exposure limits (OEL) as follows: asphalt and petroleum fumes: time weighted average limit of 5 mg/m³; short-term expo-

sure limit of 10 mg/m³. Coal-tar pitch volatiles: time weighted average limit of 0.14 mg/m³.²⁸ This places a legal duty on employers to monitor the levels of these substances in the workplace.

Malignancy of the lung, skin, larynx, mouth cavity or bladder is compensable under the Compensation for Occupational Injuries and Diseases Act, 1993, in workers handling or exposed to coal-tar, pitch, asphalt, bitumen or volatiles thereof arising from the workplace.²⁹ In the absence of a standard as to duration of exposure required, it is the duty of the medical practitioner to record this information when submitting the case, and the judgement of the compensation board as to the work-relatedness of the case.

Conclusion

The reviewed evidence suggests a causal relationship between bitumen fume exposure and cancer, since studies of occupations involving bitumen have shown significantly elevated mortality and incidence rates of cancers of the skin, lung and digestive system. However, due to confounding factors, such as exposure to coal-tar, the evidence is inconclusive. Genotoxic effects of bitumen fumes on humans have not been adequately demonstrated. Nonmalignant respiratory diseases are probably also associated with bitumen exposure, although the evidence is scarce and the causal agents unknown.

Studies have shown a relationship between BaP exposure from coal-tar pitch volatiles in the aluminium production industry, and cancers of the lung and bladder. Cohort studies on coke oven workers have shown elevated mortality from all cancers, and cancer of the respiratory tract, which were associated with PAH exposure. For the purpose of prevention of morbidity and mortality, further studies are needed to positively identify the carcinogenic agent.

South African legislation makes provisions for workers exposed to these substances, but the challenge remains to determine and quantify the risks to workers in South African industries in order for prevention to be directed.

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Implementing an air monitoring programme

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Introduction

Ever since the promulgation of the Hazardous Chemical Substances Regulations the monitoring of worker exposure to chemical substances has become compulsory. However, man's obsession with monitoring dates back as far as 1851 with the Davey safety lamp. Modern Techniques have become more sophisticated and employ electronics, chemical analysis as well as computer programmes.

Background

Regulation 6 of the Regulations for Hazardous Chemical Substances requires air monitoring to be conducted. The regulations require air monitoring to be conducted even if employee biological monitoring indicates acceptable levels in blood or urine. Measured levels can be compared against the prescribed exposure limits as listed in Tables I and II of the Regulations, thereby facilitating the institution of control programmes. It therefore helps to protect the workforce against exposure to chemical substances. Air monitoring enables companies to investigate complaints from workers, health and safety committees or trade unions. It protects companies against claims and results can be used to test the efficiency of control measures.

Regulations

Regulation 6 of the Hazardous Chemical Substances states: "if a hazardous chemical substance can be inhaled:

- Air monitoring must be conducted by an approved inspection authority
- Consultation must be undertaken with health and

safety representatives and

- The air monitoring results must be representative of worker exposure
- Must be conducted in accordance with chapters 3 and 4 of NIOSH-OESSM document PB274792 (NIOSH-OESSM: National Institute for Occupational Safety and Health - Occupational exposure sampling strategist manual).

The frequency of monitoring is described as follows:

- OEL-CL \leq substances: annually (OEL - CL Occupational Exposure limit - control limit)
- OEL-RL \geq substances: once every two years (OEL-RL Occupational Exposure Limit - Recommended limit)

It should be noted that the regulations state that air monitoring must be conducted if a hazardous chemical substance can be inhaled. If there is any doubt about exposure, monitoring must be performed. Consultation with health and safety representatives is of utmost importance. Workers should be involved in matters concerning their health. Feedback to workers is important and is required by the OHS Act.

To ensure quality in occupational hygiene, it is required that any person conducting occupational hygiene monitoring should be an approved inspection authority for occupational hygiene. Any measurements or surveys conducted by persons or entities who have not been registered by the Department of Labour (DOL) as such will not be accepted by the department. It is very important for persons who obtain the services of an "occupational hygiene professional" to make certain that it is an approved inspection authority.

Occupational Exposure Limits (OELs) are defined as: "the maximum concentration of airborne hazardous substances to which a worker can be exposed day after day for his working life without adverse effect or injury to health." These limits are numerical values expressed in milligrams per cubic meter (mg/m³) or parts per million (ppm) and serve as limits indicating "safe" exposures. Usually it is practice to control the levels to a level below the action level which is half the value of the OEL. The Regulations for Hazardous Chemical Substances, however, require exposure levels to be as low as is reasonably practicable. **Problems associated with the use of OELs, include:**

- Substances are not only inhaled, but can also be skin absorbed. To assess the total absorbed dose, biological monitoring should be carried out together with air monitoring
- OELs were set for exposure to individual substances.

Exposure effects increase when exposure to several substances that have similar effects occur

- Health status and individual susceptibility of the worker
- They are set for 8 hours per day or 40 hours per week exposure

Continuous research in the USA and UK is conducted resulting in the lowering of standards of exposure. It is therefore important to remember that what is safe today might be unsafe tomorrow!

Types of OELs

The South African exposure limits are classified as: Occupational Exposure Limit - Control Limits (OEL-CL) or

Occupational Exposure Limit - Recommended Limits (OEL-RL).

Although both are exposure limits they are totally different in nature. When standards are set they must be set at a level where no adverse health effects occur. Recommended limits are usually set far from a point of effect, but control limits are set at a level where there is a residual risk to health.

Table I: Differences

Control limits	Recommended limits
May never be exceeded	May be exceeded but,
Respirators may normally be worn when exposure levels exceed the OEL. The exposure must be controlled to below the OEL level	If the level of exposure can not be reduced respirators can be issued and workers informed and trained accordingly

Eight hour and fifteen minute OELs:

All control as well as recommended limit substances are awarded eight hour TWA or time weighted average) exposure limits. Substances with TWA limits typically cause chronic effects. Some substances, however, are awarded TWA as well as short-term exposure limits (STELs). Substances with both TWA and STEL values are substances that cause chronic effects after prolonged exposure at low concentrations, but at higher concentrations cause acute effects.

Table II: Criteria for setting of occupational exposure limits

Control limits	Recommended limits
A substance that is likely to have serious health implications on workers	A substance that has no indication that exposure over a period of time day after day will cause any injurious health effect
Compliance with the set level is usually Reasonably practicable	Likely excursions above this level are unlikely
Socio-economic factors indicate that a numerically higher value is necessary if the controls associated with exposure are to be regarded as reasonably practicable	Exposure to concentrations higher than the level is unlikely to produce serious short-term effects

Programme implementation

The best way to go about monitoring is to start by conducting a health risk assessment. Regulation 5 of the Regulations for Hazardous Chemical Substances requires that health risk assessments must be conducted by knowledgeable persons in consultation with the health and safety representatives. The assessment must be reviewed every two years. If the assessment indicates the possibility of inhalation or significant exposure, air monitoring should be conducted by an approved inspection authority. A health risk assessment is a systematic way of collecting and prioritising the risks in an area and to make recommendations about possible control measures.

Air monitoring

As required by the Regulations for Hazardous Chemical Substances, the monitoring of air must be in accordance with NIOSH-OESSM, chapters 3 and 4. Chapter 3 of this document gives guidance for the planning of the sampling strategy while chapter 4 contains procedures used to check the compliance of exposures. Classifying exposures for compliance or non-compliance in accordance to chapter 4 is however absent in most occupational hygiene survey reports.

Air monitoring is defined as “A continual process of observation, measurement and judgement of airborne contaminants”. All these phrases are equally important when monitoring is conducted. It is often found that too much emphasis is placed on measurement and observation and judgement is not adequately considered.

Exposure measurement sampling strategy

When planning the sampling strategy the following must be considered:

Homogenous exposure groups

In accordance with the definition of monitoring the workplace/task must be observed to determine if there are groups of workers with similar exposures. Such workers must be grouped together in homogenous exposure groups (HEGs) and representative samples must be collected from each group.

Maximum risk employee

OESSM chapter 3 provides for the selection of the maximum risk employee, to place the sampling device on that worker and to express all other workers' exposure in terms of the exposure experienced by the maximum risk employee. This might seem easy, but several factors can influence or complicate this selection:

- Distance from the source: usually the workers closest to the source will be the maximum risk employee
- Employee mobility: if the employee closest to the source has a high mobility he might not be the maximum risk employee. Careful observation is necessary to determine this
- Air movement patterns: these should be measured-determined as they can have a significant influence on the selection of the maximum risk employee
- Individual work habits: worker orientation/positioning towards his task. This includes to what extent workers are following standard operating procedures for the task.

Group sampling

If the selection of the maximum risk employee is uncertain then the approved inspection authority should revert to group sampling. The ultimate question to answer should be: "Would the selection of the maximum risk employee be justifiable in a court of law?"

Group sampling is based on the random sampling of a number of workers from each homogenous exposure group. The purpose of group sampling is to include at least one worker who is in the top 10% of workers with the highest exposure. To ensure that group sampling is representative of the group's exposure a sufficient number of workers must be included to ensure adequate confidences.

Confidence limits:

The following confidence limits are prescribed for group sampling:

- control limit substances - 95%
- recommended limit substances - 90%

Group sample selection process:

- Divide the workers into homogenous exposure groups
- Select from *Table III* the number of samples to be collected per group considering whether substances are control limits or recommended limits
- Number the workers per homogenous exposure group
- Use a table of random numbers to select the workers who will be included in the sample group

Locating the sampling device

There are three types of occupational hygiene sample collection techniques:

- Personal samples - the sampling device is placed on the worker and is worn continuously during all work and rest periods
- Breathing zone samples - the sampling device is held by a second individual who attempts to hold the device in the worker breathing zone. This is typical when using colorimetric tubes (e.g. Draeger tubes)
- General air samples (area sampling) - the sampler is placed in a fixed location in the work area.

For the purpose of determining worker exposures, exposure can be measured by preferably using personal samples. The use of breathing zone samples might be an alternative. General air samples are only allowed for cotton dust.

The sampling device is usually carried on the worker belt with the inlet that is placed in the breathing zone, i.e. an area within a 300mm radius from the nose. The sampling device, inlet and tubing must be placed in such a manner as to prevent interference with worker movement or with the task.

Sampling duration

The duration of samples is dependent upon factors such as:

- the sensitivity of the sampling/analytical method
- the duration and frequency of exposure

Table III: OESSM Technical Appendix A. Number of employees to sample

Control limit substances		Recommended limit substances	
Size of group (N)	Number of samples (n) Top 10% and 95% confidence limit	Size of group (N)	Number of samples (n) Top 10% and 95% confidence limit
8	7	12	11
9	8	13-14	12
10	9	15-16	13
11-12	10	17-18	14
13-14	11	19-21	15
15-17	12	22-24	16
19-20	13	25-27	17
21-24	14	26-31	18
25-29	15	32-35	19
30-37	16	36-41	20
38-49	17	42-50	21
>50	18	>50	22

- the OEL prescribed for a substance e.g. for TWA sampling periods should ideally be eight hours and for substances with STEL values the sampling period will be 15 minutes

It is however required that sampling must at least be 70-80% of the time (or shift) for it to be representative of worker exposure. The Department of Labour, however, requires that approved inspection authorities should, if they do not sample for eight hours, motivate in the report why an eight-hour sample has not been obtained. To be able to reduce the sampling time the unsampled portion must be accounted for e.g. no exposure or constant exposure. Once again this required observation of the workers performing their tasks.

Types of measurement that can be taken for an eight hour exposure standard:

Full period sampling:

- collection of a single eight-hour sample;
- collection of several consecutive samples over the total period

Partial period sampling:

- collection of a single partial period sample;
- collection of several consecutive partial period samples

Grab or random samples:

- collection of 5-8 short-term samples during the course of the workday

Taking full period consecutive samples is the "best" strategy to follow as it provides for the narrowest confidence in sampling results. Next best is taking a full-period single sample with partial period consecutive sampling as the next choice. The least desirable method is the collection of grab samples.

Whatever the strategy will be, can be dependent upon many factors, such as:

- availability of sampling equipment, analytical facilities
- availability of employees and the work operations
- the location of employees and the work operations
- precision and accuracy of sampling and analytical methods

This precision and accuracy vary and most NIOSH sampling and analysis show coefficients of variation for the sampling and analytical techniques to be 0,05 - 0,10.

- Number of samples required to obtain the required accuracy
- Whether worst case sampling or group sampling is performed
- Interday and intraday variation in concentration

Research has shown that interday and intraday variation in exposure typically lie between 1,25 and 2,5.

Recording sample results

It is important that adequate information is recorded to ensure that results can be evaluated properly and correctly. Results of air monitoring should be kept for three years in accordance with the requirements of the Regulations for Hazardous Chemical Substances.

Quality must be ensured by:

- establishment of field calibration procedures
- laboratories involved in analysis must have an occupational hygiene quality system in place (e.g.) SABS 0259
- Use NIOSH certified tubes
- Refer to manufacturers' reference material for accuracy

Classification of exposure

The Regulations stipulate that monitoring must be carried out in accordance with chapters 3 and 4 of the NIOSH OESSM document. The purpose of this is to:

- Statistically classify compliance or non-compliance
- Determine compliance to the OEL-TWA on a particular day
- Determine long-term trends based on several exposure measurements' daily averages
- Determine the percentage of days an employee can be expected to be exposed to above-standard levels of exposure
- Determine whether engineering controls should be instituted

Conclusion

Judgement as part of the definition of monitoring implies the interpretation of measurement results, but unfortunately chapter 4 is not applied to assist in this regard. The implementation of chapter 4 is however not included in this article. Air monitoring in occupational hygiene is a very important tool but it should never be forgotten that its aim is to protect workers and assist in control programmes.

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Impairment, disability and absenteeism in the workplace

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The fact that an employer accepts disability as an inevitable event among at least some of the people employed is little different from the situation where a general deploys a battalion of foot soldiers to the battlefield in the full knowledge that a sizeable number of these men are destined to be mere cannon fodder in the quest to win the war.

In defence of their attitude toward the people over whom they hold sway, both the employer and the general will argue that, in the name of the greater glory for mankind, there is a job to be done and while there are men and women who can replace the fallen, the job will be done.

Since the Industrial Revolution in the mid-1800s, human labour has proved not only to be the planet's most valuable self-replicating natural resource but also its most abundant. It should be no wonder then that the Captains of industry and the Generals of war have devoted such scant attention to the health and welfare of what amounts to an unending supply of cheap biological machinery. Indeed, it took nearly a century before workers were grudgingly granted compensation for work-related injury and a good half-century after this for society to acknowledge that certain occupations are inherently hazardous to worker health.

From all of this grew the concept of compensation for injury and illness arising from the workplace - a noble concept which, today, has spawned the monster of on demand disability compensation.

Current perception holds that any condition which renders a worker even minimally hampered in the performance of his or her job must be considered a disability and therefore compensated for through monetary reward coupled to the freedom from the need to work for a living.

It is this belief which has entirely distorted the

meaning of disability. Indeed, disability has become confused with impairment and handicap. In fact, these three are distinctly different.

Impairment versus disability

In terms of work and the ability of an individual to function within the workplace, impairment and disability should be seen as distinct entities. As such, these conditions should be measured as distinctly different issues when consideration is given to monetary compensation.

Impairment is defined by the World Health Organisation (WHO) "*as any loss or abnormality of psychological, physiological, or anatomical structure or function*".¹ Notable in this definition is that no reference is made to an ability or an inability to work. An impaired person is thus not necessarily unable to work, in other words, the person is neither disabled nor necessarily deserving of compensation.

The WHO definition of impairment is further bolstered by the definition given by the American Medical Association (AMA) which defines impairments as "*conditions which interfere with activities of daily living*" which "*include, but are not limited to self-care, and personal hygiene; eating and preparing food; communication, speaking, and writing; maintaining one's posture, standing and sitting; caring for the home and personal finances; walking, travelling, and moving about; recreational and social activities; and work activities*".²

Again, it should be noted that impairment does not necessarily equate to disability. Classical examples of impairments are deafness, blindness or loss of limbs. None of these conditions need render the impaired person unable to take up a remunerative occupation.

Disability can only be considered to be present if a permanent or temporary impairment results in the individual's inability to perform a task or activity related specifically to the performance of a remunerative function (job), whether in an occupation for which he or she was trained (so-called "own occupation") or any alternative occupation he or she may be capable of by virtue of experience, knowledge, re-training or re-skilling. Although disability may therefore refer to an activity or task which an individual cannot accomplish, it does not necessarily follow that the individual is incapable of *any* income generating activity or task.³

From this, it becomes clear that true total disability is a derivative of an impairment which is permanent and that the impairment is of such a nature that it renders the individual incapable of carrying out any tasks or activities of a remunerative nature. As an example: although a wheelchair-bound paraplegic is certainly

severely impaired in terms of the WHO and AMA definitions, this does not necessarily prevent him or her from gainful employment.

Misuse of AMA Guides

A serious error made by some disability claims assessors in South Africa is the tendency to confuse impairment with disability. But the more serious error is the practice of ascribing a percentage to the degree of impairment suffered by an individual and translating this into a measure of disability. Indeed, the *AMA Guides to the Evaluation of Permanent Impairment* emphasize that it must be "clearly understood that impairment percentages derived according to the Guides criteria should not be used to make direct financial rewards or direct estimates of disabilities".²

Unfortunately, in South Africa, misinterpretation (or misuse) of the *AMA Guides* has resulted in conflict and unnecessary dispute.

It behoves claim assessors, therefore, to utilise the *AMA Guides* purely in the context in which the authors have compiled the publication i.e. the intention to provide guidelines only and not for use as definitive measurements in awarding disability compensation.

Management of impairment in the workplace

Clarification of the distinction between impairment and disability allows for the implementation of a logical and far more meaningful protocol aimed at optimal management of these entities within the overall healthcare of the workplace setting while at the same time reducing loss of workers through poor judgment on the part of those who make decisions regarding work capabilities.

It goes without saying that early and immediate intervention is seminal to a successful reduction in work-related impairment and disability. Moreover, early recognition and intervention will certainly reduce loss of productivity and an inevitable increase in employee benefit fund costs. That the management of workplace impairment is of particular concern is reflected in the fact that it is conservatively estimated that R2,5 billion is spent annually on disability payments. Some analysts put this figure closer to R5 billion per annum.⁴ Payment for claims in 1990 on the then Workmen's Compensation Act (which falls outside compensation paid out by group benefit schemes) totalled R452 147 462 of which R2.6 million was paid out on industrial disease.⁵

More alarming statistics from the US experience underscore the urgency for improved health management in the workplace. The direct annual cost of disability in North America is estimated at \$170 billion. This equates to 8% of that continent's corporate payroll which, in turn, results in labour expenses amounting to 65% of operating costs.⁶ Add to this the fact that while employers in the United States pay \$3,63 trillion per annum in salaries and wages, an additional \$1,53 trillion (or, 42% of the total US labour cost) is paid over and above this to cover employee benefit costs.

When these figures are matched to absenteeism rates of between 7 and 15 days per year per employee in South Africa^{8,9} and 15 days (5.8% of payroll) in the US⁶ it becomes even more obvious that management of impairment should start not only at source (i.e. within the workplace) but at the earliest possible point of identification - the chronically absent employee.

Absentee auditing

Vital to preventing breakdown in worker health and the inevitable onset of impairment and potential permanent disability is early identification of pathology followed by immediate medical and/or occupational health intervention. This can only be accomplished through accurate monitoring of absenteeism in the workforce. While this may at first appear cumbersome and expensive, experience in South Africa has clearly shown the opposite.¹⁰

First and foremost, an absentee auditing programme should not be seen as a punitive exercise and should be firmly based on the upfront buy-in and consent of employees, the employer and trade unions. The process should be ethical and should not be perceived as one of interference in the relationship between the employee and his or her personal medical attendant. Nor should there be any perception of disciplinary motives. To be successful, an absentee auditing programme should be constructed with the sole purpose of ensuring that each employee has a right to the access of internationally accepted standards of health-care - both preventive and curative.

Simultaneous to this, the employee and employer should recognise that the programme is aimed entirely at developing a healthy workforce within a healthy workplace. This clearly calls for teamwork through the harnessing together of the employer's human resource facilities, the employee's attending physician, the trade union and an independent outsourced (i.e. off-site) team operating the programme. In addition, the programme should be clearly aligned to the Labour Relations Act, the various Occupational Health and Safety Acts and the Employment Equity Act.

Full transparency should prevail at all times and employees should be well-briefed in all aspects of the programme.

Absentee auditing: an 18 month pilot project

Through utilisation of existing electronic networks and a centrally sited, specifically designed IT software system, absenteeism is monitored on a *daily* basis by an independent team of doctors and occupational therapists. As wide a range of data as possible is captured and analysed while strict confidentiality and codes of conduct pertaining to medical ethics are maintained. It should be re-emphasized that central to the success of the programme is day-by-day monitoring.

The software system has been designed to "flag" individual absentee records which identifies and correlates trends ranging across the full spectrum of the workforce and the environment in which it functions. The programme is thus capable of identifying absenteeism by age, gender, ethnicity, occupation, individual task expectations, area within the workplace, site of subsidiary workplaces and shifts/hours worked as well as day of the week, month and year. This provides for the immediate recognition of anomalies in work attendance by individuals and groups as well as alerting the programme operators to abnormal absenteeism in specific areas of work.

With regard to individual employees, the system allows for early intervention in situations like the following:

- Undiagnosed/incorrectly diagnosed chronic illness
- Poor nutrition/hygiene
- Inability to access appropriate medical care
- Chronically ill employees whose medical management is suboptimal due to poor access to relevant medical care or ignorance in seeking appropriate care
- Non-compliance with medication
- Psychological and stress-related problems within the workplace or in the domestic setting
- Victimisation, discrimination or other people-related problems
- Inappropriate task allocation
- Malingering, fraud, professional collusion
- Substance abuse

With regard to occupational health and safety, the system provides monthly information on the following:

- Unsafe work areas
- Pollution (noise, dust etc.), temperature, ventilation problems etc.
- Inappropriate personal protection equipment, failure or incorrect use of personal protection equipment
- Exposure to previously unidentified hazards (physical, chemical, biological, ergonomic, etc.) in the working environment

- Machine and equipment safety-breakdowns

Cost implications of absentee auditing

At first glance, an absentee auditing programme of this nature might seem to be inordinately costly. However, the programme harnesses existing personnel in the workplace (Human Resource, Employee Care, etc.) and is funded through the cost-efficient use of the employee's medical aid scheme or State Health Services. Throughout the health management programme the employee is monitored by a multi-disciplinary country-wide network of specifically trained doctors and occupational therapists practicing within the immediate environment of the workplace.

Professional independent co-ordination of the efficient utilisation of medical aid and/or State Health facilities in conjunction with the employee's personal medical attendant is, in fact, the epitome of voluntary managed healthcare.

Added to this is a significant improvement in worker productivity and immediate reduction in claims on the employee group benefit scheme.

Most important of all, however, is the fact that the worker - especially at the lower end of the socio-economic scale - is afforded access to First World medical care while employers are able to conduct their business free of costly and time-consuming attention to the health and welfare of their most valuable asset, their employees.

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An approach to headaches

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Headaches adversely affect the quality of life, and are an important cause of absenteeism and reduced productivity at work. Headache may be primary, with no identifiable cause, or may be secondary to some other pathological process. Diagnosis and treatment of the various types is facilitated by the use of a user friendly classification

Introduction

The economic impact of headache is best measured through work related disability. Since many headache sufferers continue to work, even while in pain, it is important to account not only for lost workdays, but also reduced productivity at work.

Von Korff et al.¹ estimated that during a three month period, headache sufferers missed an average of 1.1 days per month due to their headache. Those who worked during an attack reported work effectiveness that was reduced by an average of 14%. Most of the lost working days and reduced effectiveness was due to migraine.¹

Headache is to a large extent a subjective complaint, and requires careful assessment and observation to arrive at an adequate diagnosis. Often the initial diagnosis is simply a "working one" until further evaluation, including investigations, are completed. In the assessment of headache patients it is always wise not to jump to premature conclusions, as these may be inaccurate, and may adversely influence further objective evaluation. This is especially important during the initial assessment of patients with severe headaches, since at these times judgements are of necessity made quickly, and may lead to errors in diagnosis.

Classification of headache

There are many different types of headache, and the diagnosis is facilitated by the use of an adequate classification.

The classification of headache according to International Headache Society (IHS)² criteria is very detailed and as such is not user friendly.

For most practitioners, a simpler classification such as the one below, which uses parts of the IHS classification, is very useful in the differential diagnosis of headache.

- Migraine headache
- Tension-type headache
- Combinations of migraine and tension-type headache
- Cluster headache
- Other headache disorders

The first three are the most common primary headaches, i.e., headaches which occur in the absence of an identifiable underlying disease process. These comprise the vast majority of headaches commonly seen in practice. They are not life threatening but may cause substantial deterioration in the patients quality of life^{3,4}. One study found that individuals with migraine have quality of life scores similar to patients with hypertension, osteoarthritis, and diabetes.⁴ Cluster headache is a relatively uncommon variety of vascular headache which affects men predominantly.

"Other headache disorders" are headaches which occur secondary to some other disease process. Although these are fortunately in the minority, it is mandatory to exclude them at the initial evaluation, as they may indeed be life threatening.

Secondary headaches

The secondary headache aetiologies which are of greatest concern, and essential to recognise are:

- Space occupying lesion such as tumour, abscess, haematoma.
- Sepsis, eg., meningitis, encephalitis.
- Stroke - infarction, intracerebral haemorrhage.
- Subarachnoid haemorrhage (SAH).
- Systemic disorders, eg., thyroid disease, hypertension, diabetes, pheochromocytoma.
- Temporal arteritis.
- Traumatic head injuries.
- Ophthalmologic, otolaryngological, and dental causes of headache.

This list is not exhaustive, but includes the most common causes of secondary headache.

Signs, symptoms, and patterns to be aware of are:

- Acute new, usually severe headache, or headache that is different to prior headaches.
- Headache on exertion, including sexual activity.
- Onset at night or early morning.
- Associated fever or other systemic symptoms.
- Neck stiffness.
- Neurological signs.
- Precipitation of head pain with the Valsalva manoeuvre (by coughing, sneezing, or bending down).
- New onset in adults over 50 years old, and headache in children.

If no cause is found for the headache, it is then classified as a primary headache. It may also occur that once the underlying pathology thought to be causing the headache has been treated, the headache persists. In this event, the headache is reclassified as primary.

Primary headaches

The two main categories of primary headache are Migraine (MI) and Tension-Type Headache (TTH).

The pain from MI is thought to involve three mechanisms. These mechanisms are:⁵

- extracranial arterial dilatation (particularly the frontal branch of the superficial temporal artery),
- extracranial neurogenic inflammation, and
- decreased inhibition of central pain transmission.

There is some controversy regarding the origin of the pain in TTH, but many of these patients have tenderness and/or dysfunction of the craniomandibular and/or craniocervical muscles.^{6,7}

The third important group of primary headache is Chronic Daily Headache (CDH). Recent studies suggest that CDH is present in about 4% of the population, with a prevalence of 40-60% of headache sufferers seeking treatment.⁸ This group comprises patients whose symptoms include elements of both MI and TTH.

The division between MI and TTH has been challenged by a number of authors.⁹⁻¹² There is, however, a great deal of experimental evidence to indicate that MI and TTH probably form part of a continuum, and differ only in the severity of the symptoms experienced.^{9,10,13,14} This is supported by the fact that CDH can develop from either MI or TTH.

The overlap between the different types of primary headaches makes accurate diagnosis difficult. This is illustrated by the following excerpt from the IHS classification "Patients (with primary headaches) represent a continuum varying from those having pure migraine over those with migraine and moderate amounts of tension-type headache, those with half of each, those with a preponderance of tension-type headache, to those with pure tension-type headache".² In practice, it is uncommon to find headache sufferers with either pure vascular pain or pure muscular pain - the overwhelming majority have pain of mixed origin.

Diagnosis of Migraine

Diagnosis of MI may be difficult because it is often difficult to elicit precise information from a patient who is trying to translate symptoms into words, the symptoms are often similar to TTH, and the manifestations of individual migraine attacks varies considerably between and among individuals.

The diagnosis of MI is made;

- when certain pain characteristics are present, such as throbbing nature, unilateral pain, pain which worsens with mild exercise such as going up stairs, and pain of moderate or severe intensity which affects the patients ability to carry out their normal daily activities.
- when associated symptoms such as photophobia, phonophobia, nausea, and vomiting are present.

Approximately 10% of migraine sufferers have transient focal neurological symptoms, referred to as aura.

The aura usually (but not always) precedes the pain. The aura most often takes the form of visual disturbances such as teichopsia or scotomata, but may also be a spreading numbness or tingling affecting the hand and spreading up the arm to the face and jaws. Aphasia may also occur.

The presence of these pain characteristics and associated symptoms are not diagnostic, but rather, are suggestive of MI. The more of these that are present, the more confident one can be of the diagnosis.^{9-11,14,15}

A simple diagnostic test which is positive in about 50% of migraine sufferers is to digitally compress the superficial temporal artery on the painful side, where it crosses the zygomatic arch just above the temporomandibular joint. The artery is easier to locate during a migraine attack, as the pulse volume is greater than normal. If the pain subsides immediately, then there is no doubt as to the diagnosis. When the compression is removed, the pain usually returns almost immediately.

Treatment of Migraine

Palliative

The treatment of choice during attacks varies with the severity and the stage of the attack.

Non-drug treatment should be the first choice - patients may benefit from bed rest in a cool, quiet, dark room. A cold compress applied to the forehead and temples may also afford relief. Other therapies such as biofeedback, exercise, TENS, and physiotherapy may also be beneficial.

Drug treatment should be carried out using the principle of sequential testing of active ingredient, dose, and formulation (such as oral tablets, soluble tablets, suppositories, nasal spray, and parenteral). The safest, best known, and cheapest drugs should be tried first, as per the list below, and the lowest effective dose should be aimed at.¹⁶

OTC analgesics (acetylsalicylic acid, paracetamol, ibuprofen)

OTC analgesics with additional metoclopramide.

Metoclopramide is effective against nausea and vomiting (preferably given rectally or parenterally), and increases the absorption of the OTCs, especially if taken orally 20-30 minutes before the OTCs.

Non-steroidal anti-inflammatory drugs, especially naproxen, possibly with the addition of metoclopramide.

Ergotamine (combinations are the only products on the market) and its derivatives (dihydroergotamine). It is important not to exceed the maximum recommended dose per attack and per year.

Tryptans.

Prophylaxis

A diary may contribute to the identification of the provoking factors (dietary, hormonal stress, etc.).

According to the IHS, there is a varying degree of

TTH in most MI sufferers.² Successful reduction in MI pain associated with the muscle dysfunction of the associated TTH component has been achieved with the use of intra-oral appliances, which bring about relaxation of the craniomandibular and craniocervical musculature.^{17,18} Patients who receive this type of therapy are very often able to discontinue the use of drugs completely! Consequently, in migraine sufferers with muscle dysfunction or increased muscle tonus, intra-oral appliance therapy is the preventative treatment of choice. Biofeedback, exercise, TENS, and physiotherapy may also be beneficial.

Should conservative prophylactic measures not be successful, drug therapy may be instituted. Prophylactic use of drugs for migraine depends on the frequency and intensity of attacks. The decision whether the therapeutic benefit offsets the possible side effects and the burden of daily drug intake should be taken by the patient.

Choice of prophylactic drugs includes beta blockers, pizotifen (may lead to weight gain), naproxen (unpopular due to adverse intestinal effects), methysergide (may cause retroperitoneal and pleuroperitoneal fibrosis).¹⁶

Diagnosis of Tension-Type Headache

In TTH as opposed to MI, the pain is more often constant instead of throbbing, and bilateral instead of unilateral. Mild exercise does not exacerbate the pain, and the pain is mild to moderate, and doesn't usually inhibit normal daily activities.

Associated symptoms such as photophobia, phonophobia, and nausea may be present, but are usually less frequent or less severe than with MI.

Treatment of Tension-Type Headache

The treatment of choice for TTH is relaxation of the pericranial musculature. There are several ways to achieve muscle relaxation, including intra-oral appliance therapy, biofeedback, physiotherapy, TENS, and exercise.

The correct intra-oral appliance will reduce muscle tension in most patients, and the need for ongoing physiotherapy, biofeedback, TENS, and exercise is eliminated.

Drug treatment is not advised for TTH, and in particular, muscle relaxants are not very effective. Tricyclic antidepressants are effective in some patients, but should not be given on a routine basis.

Analgesic Rebound Headache (ARH)

ARH may result from the regular use of analgesics, and may complicate MI or TTH. The original headache becomes more frequent and more severe. The dosages which may lead to analgesic rebound need not be very

high. Narcotic analgesics and compounds with added barbiturates or other non-narcotic compounds are more likely to lead to rebound than mild analgesics taken on their own. Patients' intake of analgesics should therefore be carefully monitored, and care should be taken to point out the dangers of the chronic use of analgesics.

Summary

In headache patients, secondary headache should first be excluded. Once this has been done, the underlying causative factors and triggering factors of the primary headache must be identified and treated. Medication should be reserved for intractable cases, utilising the lowest effective dose of the safest, best-known, and cheapest drugs first.

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Ergonomics in occupational health

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Introduction

Every business aims to make profits through the production of a product or service, with the most valuable resource for each business being the employee. A healthy workplace offers significant benefits which include:

- increased productivity
- prevention of claims for occupational injuries and diseases
- reduced absenteeism; and
- general benefits to the employee of good personal health.

Companies must have annual health risk assessments carried out by relevant competent persons. This ensures that any occupational health related problems are either prevented or detected early and remedial action taken, either in the production process or in the wearing of personal protective equipment (PPE).

Occupational health practitioners (OHPs) are the only personnel in an organisation trained in occupational health. They collect all the health statistics for the company and are thus aware of the incidence and cause of work-based injuries, including all those of a musculo - skeletal nature. They could therefore integrate ergonomics with the working environment.

Legislation

The Occupational Health and Safety Act (1993) states that “every employer shall provide and maintain a working environment that is safe and without risk to the health of his employees”. The majority of employers view hazards and risks as relating to safety, noise, chemicals, heat and dust, and they do not often identify the hazards caused by poor layout and design, which can lead to injuries and musculo-skeletal problems.

In the light of the OHSAct, employers are legally required to identify ergonomic risks and protect their employees from injury such as repetitive strain injury occurring due to poor ergonomic conditions. In terms of the Compensation for Occupational Injuries and

Diseases (COIDA) of 1993, employees could claim under the various classifications of disablement, should it be proven that a back or shoulder injury was caused by poorly-designed work processes or badly positioned machinery. Employers must therefore be made aware that poor workplace ergonomics pose a risk which could actually cause occupational injuries, which are compensatable under the COIDA Act.

The role of ergonomics

Managers, engineers and health and safety officers, are not trained in all aspects of ergonomics.¹ Therefore when they are designing work processes or purchasing new machinery, they aim for optimum productivity and efficiency, and do not necessarily consider a process which ensures the comfort and well being of the employee. They also do not realise the importance of anthropometrics, the measurement of the human body.² Different races have different body dimensions, which is significant in cases where an employee is using a machine, particularly in South Africa where many machines are imported from overseas. These machines often have incorrect dimensions for South African body measurements and this can lead to significant ergonomic problems, as well as compromising productivity.

Applying ergonomic principles is often the answer and can be defined as “fitting the task to the man, and not the man to the task”.³

Clearly ergonomics can be applied to any occupation or activity, however it is usually applied to the workplace and should be an integral part of the occupational health programme.

The aim in ergonomic assessment is to ensure that the work is planned and laid out to optimise system performance by enhancing human performance. It is therefore important that processes, machines, equipment, tools and environmental aspects are designed or modified so that they can benefit workers and enhance productivity.

The effects of poor ergonomics include:

- reduced concentration
- discomfort
- fatigue

These could lead to:

- reduced productivity
- errors
- accidents, and
- occupationally-related health problems.

Research has identified optimal measurements which are utilised by ergonomists internationally in terms of load mass to be lifted, diameters of tool handles and postures for lifting.⁴

It is important to recognise ergonomics as an integral aspect of health at work, and make the provision of an ergonomically correct workplace part of the role of occupational health practitioners. A person who is trained in ergonomics, is familiar with the workplace and the incidence of ergonomically-related occupational injuries, and is in the ideal position to take necessary action. Changes can be recommended to work processes and the managers and employees can be trained in this regard.

Frequency of injuries

It is widely accepted that poor workplace ergonomics can cause chronic musculo-skeletal problems. Due to the insidious nature of these problems the symptoms are often tolerated by the employee and are not specifically recognised as being caused by sub-optimal process design, awkwardly positioned machinery, incorrectly designed tools, or unsuitable working position. This is particularly true for employees working in production lines and within office environments.

From analysis of 1997 statistics collected from the clinics run by Afrox Occupational Healthcare (AFROHC) in a cross-section of companies throughout South Africa, an average of 22% of the consultations within the clinics was due to musculo-skeletal disorders, including:

- back pain
- myositis
- fibrositis
- myalgia
- arthralgia
- arthritis
- tenosynovitis
- sciatica and
- muscle spasm.

Further analysis of the working environments of some of these employees, showed that many of these conditions were caused or exacerbated by poor posture while carrying out their work either while sitting, standing, bending or lifting.

Further investigation of the working environment is therefore required and this can only be achieved by carrying out an ergonomic survey.

Integration into the workplace

Companies have some options in ensuring ergonomically suitable environments. They could:

- have an ergonomics survey carried out by an external ergonomics specialist or
- integrate ergonomics as part of their occupational health programme.

The latter option is clearly the option of choice for the following reasons:

The occupational health practitioner will play an important role in this and can integrate physical and organisational ergonomics as part of the annual occupational health programme.⁵

Occupational health practitioners (OHPs) are very familiar with the workplace and they can:

- carry out regular walkthroughs of the site
- use ergonomic checklists to assess individual workers in different work situations
- when employees visit the clinic with a musculo-skeletal problem which may be work related, the clinic personnel can visit the employee's working environment and make recommendations for changes as necessary
- regularly analyse statistics and identify trends by department in relation to incidence of musculo-skeletal problems and investigate areas with high incidence
- Institute and manage appropriate controls.

OHPs can further ensure that:

- the company is informed on a regular basis of ergonomic problems in the workplace in order to make essential process, equipment or procedural changes
- health education programmes include aspects such as lifting and handling, posture and general fitness.

Case example

Using the range of AFROHC developed ergonomic checklists, an occupational health sister was able to carry out a physical ergonomic assessment of an engineering company, where she is employed on a part-time basis. This company is a NOSA graded company.

Following training by the AFROHC ergonomic specialist, the clinic sister systematically observed and questioned employees and then completed the appropriately developed checklists.

A range of different checklists were available to suit specific job requirements within each company. Prior to the survey, the sister felt that she was fairly familiar with the plant. However, carrying out the survey was extremely enlightening to her. Working operations were observed from an ergonomic viewpoint: and this included lifting, equipment design and controls, workstation layout, lighting and ventilation. All information obtained using the checklists was consolidated into a professional report which was presented to management outlining the ergonomic problems and recommendations to improve the working situation.

Some of the problems were minor and could be easily and quickly remedied such as raising the height of a table, providing a trolley with the correct height and type of handles, provision of anatomically correct tools and teaching correct lifting techniques. Other problems were due to poor work organisation and layout, and anthropometrically incorrect machine design. These involved significant capital outlay, such as purchase of new machines which allow employees space to move freely, and the moving of machinery to prevent unnecessary transportation of materials between work areas. These would therefore be addressed in a longer-term management programme.

Once the ergonomic survey report was analysed by management, the clinic sister was assured of management commitment. Meetings were held between risk control management, the operations manager, heads of departments and the clinic sister. Discussions centred on which recommendations could be actioned, both short and long term, cost implications if any and predicted target dates. In this case, the commitment to the SHE Programme, which included ergonomics meant that it went from an unrated company in 1997, to a 3 Star NOSA company in 1998 and a 5 star NOSA company in 1999.

Conclusion

Ergonomics is essential within occupational health and ergonomic assessments should be an integral part of a planned occupational health programme run by a qualified OHP. When occupational health personnel are trained in ergonomics, they view the workplace from a different perspective. This in turn gives them deeper insight into the work requirements of each employee, which is ultimately of great benefit to addressing occupational health needs.

References

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5. Ergonomics Society of South Africa - Quarterly Newsletter No 17 (2nd Quarter 1999) P8. Definitions of specialisation within ergonomics ESSA

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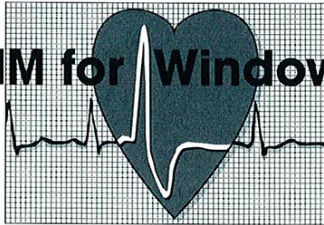
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Occupational Hygiene Sites

David W. Stanton[†], Frank Fox[§],
Hans van der Merwe[†]
Chamber of Mines[†]; Mondi Ltd.[§]; Polifin[†]

Occupational Health SA 2000; Vol 6, No.2:29 - 30

This sixth NetPage lists occupational hygiene and related web sites. The sites listed can be easily

accessed via the Occupational Hygiene page of ASOSH.ORG (located via Societies & Related at World Links). Extensive links to Chemical related information (Analytical methods, OELs, laboratory safety, MSDS, transport, safety manuals etc.) can be found at the Chemicals page of ASOSH.ORG (located via World Links).

The next four issues in 2000 will focus on Epidemiology, Ergonomics, Health Physics and Industrial Psychology. We look forward to your comments and links for the NetPage and ASOSH.ORG.

Discussion Groups

Discussion Board (<http://www.industrialhygiene.com/messageboard/>) www.industrialhygiene.com, USA
Mailing List Manager (http://www.industrialhygiene.com/mail_list.html) Service to subscribe and unsubscribe easily to various mailing lists

Discussion Groups (<http://www.ccohs.ca/resources/>) CCOHS, Canada. Extensive listing

List Serves (<http://freeweb.pdq.net/ennis/ih/listservs6.htm>) Industrial Hygiene Resource Pages, USA

GlobalOccHyg-L (<http://www.ccohs.ca/resources/listserv.htm>) International mailing list. Official list of the International Affairs Committee, American Industrial Hygiene Association

IH List (<http://www.aiha1.org/Committees/CAC/ih-list-FAQ.htm>) American Industrial Hygiene Association
Archive (<http://siri.uvm.edu/mail/>) Vermont SIRI, USA

Industrial Hygiene Forum (<http://www-nehc.med.navy.mil/ihforum.htm>) US Navy

OccHygPro (<http://www.crboh.ca/OccHygPr.htm>) Canadian Registration Board of Occupational Hygienists (CRBOH).
International discussion group for occupational hygiene personnel accredited in accordance with one or more of the schemes identified by the International Occupational Hygiene Association (IOHA)

OHASAnet (<http://www.egroups.com/group/ohasanet/>) Occupational Hygiene Association of Southern Africa (OHASA), South Africa

U.K. Occupational Hygiene e-mail list (<http://www.egroups.com/list/ukoh/>)

Government and Public Service

Army IH Home Page (<http://chppm-www.apgea.army.mil/Armyih/>) US Army

Industrial Hygiene Directorate Homepage (<http://www-nehc.med.navy.mil/ih/>) Navy Environmental Health Center (NEHC), US Navy

Industrial Hygiene Technical Manuals (<http://www-nehc.med.navy.mil/ih/tm.htm>)

Navy Industrial Hygiene Field Operations Manual (<http://www-nehc.med.navy.mil/ih/ihfom99.htm>)

Career Development Program for Safety and Occupational Health and Industrial Hygiene Personnel
(<http://www.norva.navy.mil/navosh/CDP.htm>) NAVOSH, US Navy

Industrial Hygiene Branch (<http://sg-www.satx.disa.mil/iera/rsh/IndustrialHygiene/index.html>) Institute for Environment, Safety, and Occupational Health Risk Analysis (IERA), US Airforce

Department of Technical Hygiene (<http://umetech.niwl.se/English/Default.html>) National Institute for Working Life, Sweden. Includes databases for hand-arm and whole-body vibration

EPA Topics (<http://www.epa.gov/epahome/browse.htm>) EPA, USA

Indoor Environments Division (<http://www.epa.gov/iaq/>)

Industrial Hygiene (<http://www.safetek.com/ih.htm>) Safety and Health Solutions, Safetek, USA

Overview of Occupational Safety and Occupational Health/Industrial Hygiene (<http://www.safetek.com/program/sec5.html>)

Institut de recherche en santé et en sécurité du travail du Québec (IRSST) (<http://www.irsst.qc.ca/indexe.htm>) Occupational Health and Safety Research Institute, Québec, Canada

Publications (http://www.irsst.qc.ca/htmen/3_0.htm)

Useful Links (<http://www.irsst.qc.ca/htmen/urls/urlsindex.htm>)

Leaflets about Hazards at Work (<http://www.open.gov.uk/hse/pubns/hazards.htm>) HSE, UK

Occupational Hygiene (<http://www.ccohs.ca/resources/occhyg.html>) CCOHS, Canada

OSHA Alphabetic Site Index (<http://www.osha-slc.gov/html/subject-index.html>) OSHA, USA

OSHA Technical Manual (http://www.osha-slc.gov/dts/osta/otm/otm_toc.html)

Industrial Hygiene (<http://www.osha-slc.gov/Publications/OSHA3143/OSHA3143.htm>) Informational Booklet

Analytical Methods (<http://www.osha-slc.gov/dts/sltc/methods/index.html>) Technical Links

Topic Index (<http://www.cdc.gov/niosh/toplst.html>) NIOSH, USA

Selected Topics: Industrial Hygiene (<http://www.cdc.gov/niosh/indhygpg.html>)

NIOSH Manual of Analytical Methods (NMAM), 4th ed. (<http://www.cdc.gov/niosh/nmam/nmampub.html>)

Occupational Hygienist

- Ed Bartosh's Favorite Web Pages (<http://www.bartosh.com/eds-page.html>) USA
- Industrial Hygiene Resource Pages (<http://freeweb.pdq.net/ennis/ih/>) Deanna M. Ennis, USA
- The Occupational Hygienist's Vade-mecum (<http://www.bloor.demon.co.uk/occhyg/>) David M Bloor, UK. "Constant Companion" or "Ready Reference"
- [www.industrialhygiene.com](http://www.industrialhygiene.com/index.html) (<http://www.industrialhygiene.com/index.html>) Grady Russell, USA. Includes IH calculations Links (<http://www.industrialhygiene.com/links/>)
- Reference Books (<http://www.industrialhygiene.com/books.html>)

Society

- American Board of Industrial Hygiene (ABIH) (<http://www.abih.org/>)
- Certified Industrial Hygienist - A Mark of Professionalism (<http://www.abih.org/Docs/mark-pro.htm>)
- Certified Industrial Hygienist (CIH) - What it means (<http://www.abih.org/Docs/what-is-ci-h.htm>)
- The American Board of Industrial Hygiene: History (<http://www.abih.org/Docs/ABIH-history.htm>)
- American Conference of Governmental Industrial Hygienists, Inc. (ACGIH) (<http://www.acgih.org/>)
- Publications (<https://www.acgih.org/catalog/index.htm>)
- American Industrial Hygiene Association (AIHA) (<http://www.aiha.org/>)
- Local Sections (<http://www.aiha.org/local.html>)
- What is Industrial Hygiene/FAQs (<http://www.aiha.org/index2i.html>)
- CEE OSHNet (<http://www.freenet.hamilton.on.ca/~aa011/ceeosh.htm>) Central & Eastern European Occupational Safety & Health Net. "Unofficial" home page of the AIHA's International Affairs Subcommittee for Central and Eastern Europe (CEE)
- Australian Institute of Occupational Hygienists (AIOH) (<http://www.aioh.org.au/>)
- British Institute of Occupational Hygienists (BIOH) (<http://www.bioh.org/>)
- BIOH Qualifications (<http://www.bioh.org/qualifications/index.html>)
- British Occupational Hygiene Society (BOHS) (<http://www.bohs.org/>)
- BOHS Procedures Manual (<http://www.bohs.org/pubs/procs/index.html>) Internal BOHS procedures
- L'Association québécoise pour l'hygiène, la santé et la sécurité du travail (AQHSST) (<http://www.aqhsst.qc.ca/>) Quebec Association for Industrial Hygiene and Occupational Health and Safety. French language site
- Canadian Registration Board of Occupational Hygienists (CRBOH) (<http://www.crboh.ca/>)
- External Links (<http://www.crboh.ca/external.htm>) Includes Local Chapters
- Occupational Hygiene Association of Ontario (OHAO) (<http://www.ohao.org/>) Canada
- What is Occupational Hygiene? (<http://www.ohao.org/whatis.htm>)
- Nederlandse Vereniging voor Arbeidshygiëne (NVvA) (http://www.arbeidshygiene.nl/index_1.html) Dutch Occupational Hygiene Society
- Norsk Yrkeshygienisk Forening (NYF) (<http://www.takvam.no/nyf/>) Norwegian Occupational Hygiene Association
- Polskie Towarzystwo Higienistów Przemysłowych (PTHP) (<http://www.imp.lodz.pl/pthp/pthp.htm>) Polish Association of Industrial Hygienists
- Schweizerische Gesellschaft für Arbeitshygiene (SGAH) (<http://www.sgah.ch/>) Swiss Occupational Hygiene Society
- Svensk Yrkes- och Miljöhygienisk Förening (SYMF) (<http://hem.passagen.se/symf/index.html>) Swedish Association of Occupational and Environmental Hygiene
- International Occupational Hygiene Association (IOHA) (<http://www.bohs.org/ioha/index.html>)
- Publications (<http://www.bohs.org/ioha/epubs/index.html>)
- International Society of Exposure Analysis (ISEA) (<http://www.iseaweb.org/>) USA

University

- Hygiène et sécurité industrielles (<http://www.uqtr.quebec.ca/~austin/>) The Université du Québec à Trois-Rivières, Canada
- Industrial Hygiene Research Guide (<http://www.uml.edu/Dept/WE/ihrsguide.htm>) Department of Work Environment, University of Massachusetts, USA
- Occupational & Environmental Hygiene (<http://www.interchange.ubc.ca/occhyg/occhhome.html>) University of British Columbia, Canada
- Occupational Hygiene Unit (<http://www2.deakin.edu.au/occ-hyg/>) The School of Biological & Chemical Sciences, Deakin University, Australia
- Occupational Hygiene Unit (<http://www.safety.ed.ac.uk/occhyg/>) University of Edinburgh, UK
- Western Kentucky University Industrial Hygiene Student Association (<http://www2.wku.edu/www/stuorgs/ihsa/index.html>) USA

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Who appointed you the gatekeeper?

To the editor

A visiting occupational medicine specialist once admonished me by asking: "Who appointed you the gatekeeper to compensation?" I could only hang my head and admit that I had conferred the honour on myself. The question arose because I had concluded a case presentation by saying that I was not going to submit the case because in my view his disease - COPD - was not caused by work (welding for 5 or so years) because he had smoked a lot for over 20 years. I am reminded of this interchange often because many doctors make the same mistake: believing that their opinion is sufficient grounds to submit or not. Why is this wrong? Because we then constitute ourselves into a self-appointed, one-person assessment committee that has already adjudicated the case. This kind of committee is often short on dissenting opinion, knowledge of the law and of the social basis for compensation, and may close the gate on eligible - as distinct from "medically deserving" - cases.

I am not suggesting that every case must willy-nilly be granted compensation. What I am suggesting is that we are obliged to tell patients about compensation and then submit a claim for every person who wants us to unless we have a clear reason not to. One clear reason would be an "instruction" from the Compensation Commissioner. For example, it is unnecessary to submit cases of asbestos-related pleural disease who have lung function tests within the reference range because the third schedule of the COIDA Act informs us that they must have significant impairment of lung function to be eligible. (In passing, it is just because these "instructions" are so scarce that we have such a problem: in the

absence of administrative standards we have no basis not to submit.) Another clear reason would be the absence of any reference to a link between the disease and the exposure in an up-to-date standard textbook. I do not believe that asbestos exposure is causally associated with laryngeal cancer, but there is reference to such a possibility in most textbooks. Consequently I must submit cases of laryngeal cancer who have occupational exposure, even if they are alcoholic smokers, until the Commissioner informs us that we should not.

Submitting a claim in spite of one's opinion that the disease is probably not caused by work does not mean raising false expectations, and nor does it mean simply submitting a claim form to the Commissioner's office. If we feel that the disease is not due to work and that the Commissioner will reject the case we should tell the patient this. I think that it is wrong to just submit a case to the Commissioner and leave it to up to the overloaded doctors in the compensation office to sort it out. A considered and referenced discussion of the scientific merits should accompany the claim forms, but of course this is next to impossible in busy primary care practices, one of the reasons we need occupational medicine referral clinics in South Africa.

In closing, to perform our function in the compensation system we need to understand it. Unless we have been formally appointed, no-one has asked us to adjudicate cases.

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Murray Coombs from The Institute emphasised the need for management to integrate and align health, safety and environmental matters into business goals, job descriptions, strategic and day-to-day objectives. It should become part of every company's everyday business, he said.

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New society formed

Congratulations to the occupational hygienists on the formation of the Southern African Institute for Occupational Hygiene (SAIOH). This is an amalgamation of the Occupational Hygiene Association of Southern Africa (OHASA) formed

in 1983 and the Institute of Occupational Hygienists of Southern Africa (IOHSA) formed in 1993. We now finally have one occupational hygiene society (SAOIH) with an independent examination board. Full details on the new society will be published in the May/June 2000 edition of Occupational Health Southern Africa.

More information from Ray Strydom at (012) 654-8349.

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