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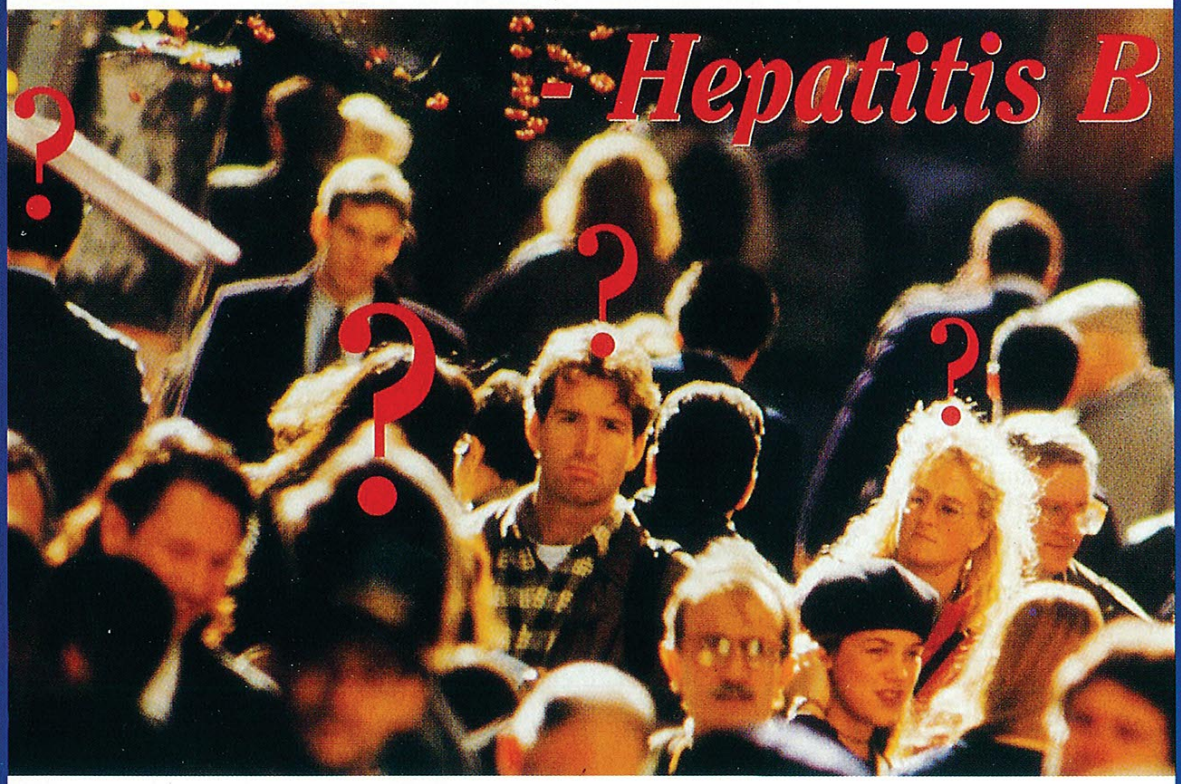

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A CANNON MEDICAL MEDIA PUBLICATION

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CPD Update

Many professions are now using Continuing Professional Development (CPD) to upgrade the skills and knowledge of their members. In this editorial some comments are made on the journal's system for medical practitioners, but readers should note that the occupational hygienists are also required to accumulate points to remain registered and this process is shown on page 4. Furthermore there are currently discussions under way within the nursing profession on this issue and it is likely fairly soon they will also need to accumulate points to remain registered.

The journal is now 4 editions into its CPD programme for doctors and it is appropriate to reflect on some of the benefits and problems that have arisen. There are two ways doctors can be awarded points; by having articles published and by filling in the questionnaire. Firstly authors may be awarded up to 15 points depending on the type of article and number of authors. These points are category three points under the Health Professionals Council of SA (HPCSA) classification. After the article has been published, the SASOM office will send the authors (doctors) a certificate with their point allocation. Any authors who have not received their points should contact the SASOM office.

Secondly the completed questionnaire can earn the doctor submitting the form 3 points if they get 60% or more of the questions correct and no points if they get less than 60%. The results are kept at the SASOM office and at the end of each year, those who have submitted questionnaires will be sent a certificate by SASOM with the total number of points they have earned. At present the SASOM office is receiving between 40-50 questionnaires per edition with an increasing trend with each new edition. Due to the costs involved, questionnaires are only processed if the doctor is a member of SASOM or a subscriber to the journal.

Most of the criticism we have received relates to the ambiguity of the multiple choice questions. These are set by the authors with editorial input. However multiple choice types of questions do not suit every respondent and hence the pass mark set at 60%. On the positive side, we hope the CPD initiative will improve readers' knowledge and that more practitioners will subscribe to the journal or join SASOM.

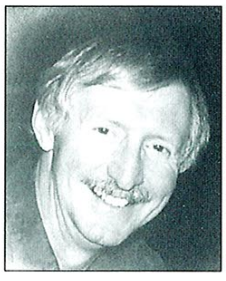
Occupational lung disease

It is clear that there is a huge burden of undiagnosed occupational lung disease out there in the community and Rees has clearly shown that it is grossly underreported. Whether any improvements can be made in the future to rectify this with much of the focus and resources going to the HIV/AIDS epidemic remains to be seen. The recent ruling by the House of Lords in the UK against Cape plc will hopefully, if successful, bring much needed money to asbestos sufferers in some of the poorest areas in the country.

Chronic disease rehabilitation

The article by Coopoo et al has shown clearly how successful an in-house rehabilitation programme at Mondi has been. What is of significance is that medication costs decreased significantly, and productivity improved, something that will strike the right chord in industry. There has obviously been a significant input by several health care workers to make this programme work and it is hoped it will continue into the future.

Dr MD Baker
Honorary Editor



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The Points Maintenance System of SAIOH

The Southern African Institute for Occupational Hygiene (SAIOH) has instituted a points system in keeping with its commitment to professionalism and ongoing competence and growth of its members.

The cornerstone of the maintenance system is based on the process of continually increasing the skills and knowledge base of occupational hygiene practitioners. The system would also ensure that practitioners keep up-to-date with technological advancements as well as new developments in occupational hygiene.

The points maintenance system is based on the American Institute of Occupational Hygiene system. The proposed system is a "honour" system which means that each person is responsible for keeping their own records. A certain percentage of members will be sampled at random to be audited each year, although the cycle period is five years.

The proposed system was implemented in 1998. Although a cycle of five years has not elapsed the first four audits will be used as trials.

The points maintenance system will ensure:

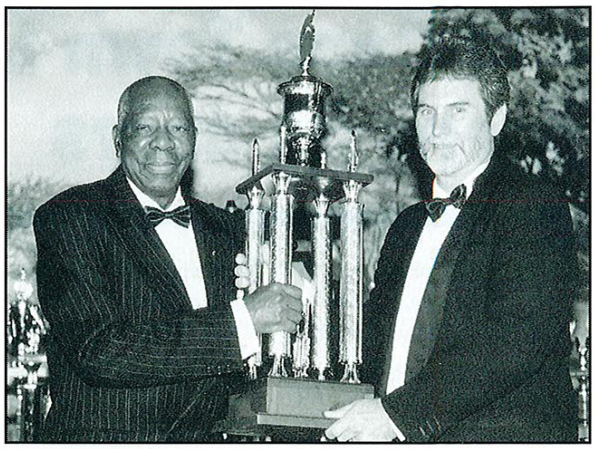
- the ongoing competence of occupational hygiene practitioners,
- a stimulus for growth in the profession,
- that lower-trained prac titioners and practitioners with different qualifications and backgrounds are encouraged to upgrade their skills, and by doing so SAIOH will fulfil its mission and ultimately its vision.

The points maintenance system is an "honour" system. This means that you have to keep your own records. A certain percentage of members are audited each year. If you do not keep record of your points or do not accumulate enough points you automatically forfeit your classification and have to re-apply for registration.

To maintain your registration as a Professional OH, OH, OH Technologist and OH Assistant you have to accumulate 50 points over a five year period, with a maximum of 5 points per category and 15 points per year.

For more information contact:
R Ferrie (011) 806-8784
O. Schoeman (012) 608- 0018

CATEGORY	ACTIVITY	POINTS	REMARKS
1 Active OH practice	Practice, or lecturing .	5 points per year	Six months or more per year
2 Training and education courses	Attendance of courses Attendance of workshops, seminars, etc. Presentations/lectures at workshops, seminars, conferences, etc.	0,5 points per day for approved course 0,5 point per day for approved workshop, seminar, etc 0,5 per hour lecturing, approved courses, etc.	In-house staff training will not be considered
3 Technical/Professional OH committee	Council attendance Sub-committee	2 per year for attendance 1 per year for attendance	Must attend more than 70% of meetings
4 Professional membership	Membership of OH associations	0,5 per year	Must be a paid-up member
5 Publications	Primary author Secondary or other author	4 for peer reviewed articles 3 for peer reviewed articles 1 for other article 1 for peer reviewed articles	Local journals Overseas journals Any journal
6 Mentorship (Contact secretary for information)	Mentorship Student	3 points per student per year 1 point per year	
7 Examination/Certification	As OH As OH Technologist As OH Assistant	5 4 3	Once off allocation on successful certification of any category of registration



Inus Labuschagne of Sasol Bosjiesspruit was awarded best industrial hygienist at the recent Noshcon conference. Here he received his award from Chairman of the NOSA Board, Mr Lekgau Mathabathe

SASOM / SASOHN joint confe-rence

SASOM (The South African Society of Occupational Medicine) and SASOHN (The SA Society of Occupational Health Nurses) will be hosting a joint conference from 8 to 10 November 2000 at Ceasar's Conference Centre in Boksburg, Gauteng.

Sessions will include topics such as tropical infections and diseases, employment equity in the workplace and environmental issues.

The conference is CPD accredited and attending medical practitioners will qualify for points.

More information from SASOM national office (012) 667-5161 or e-mail sasomdm@iafrica.com.

University of Cape Town Lung Institute opens its doors

At a time of cutbacks in expenditure on health and education, a private company has made a large contribution to the establishment of a University of Cape Town-based research institute.

The international pharmaceutical company Boehringer Ingelheim has helped build South Africa's first Lung Institute which will house five research units.

The Institute, the likes of which have not previously been available within the academic hospital and Faculty of Health Sciences, will be professionally managed by a board of directors comprising members of the university executive, the Faculty and other interested parties. The building was officially opened in April.

With South Africa's high incidence of lung disease, and research indicating that smoking rates and the problems of asthma, chronic bronchitis, emphysema and tuberculosis have reached alarming proportions, the need to actively tackle these diseases was a motivating factor in initiating the formation of a Lung Institute at the University of Cape Town.

The Lung Unit will be run by Professor Eric Bateman, with the Allergology Research and Diagnostic Unit under Associate Professor Paul Potter, the Occupational Health Unit under Associate Professor Neil White, an Infectious Disease Unit under Associate Professors, Gary Maartens and Robin Wood and a Skin Centre run by Associate Professors, Norma Saxe and Gail Todd.

These units offer expert clinical services on an outpatient consultation basis as well as perform a variety of forms of clinical research. These include studies in the fields of epidemiology, health systems research, disease management, pharmacoeconomics, and pharmacokinetics and phases one to three pharmaceutical trials.

Special facilities in the institute include a sleep study laboratory, a comprehensive allergy diagnostic and antigen challenge laboratory, a lung function and exercise testing laboratory, a phototherapy unit, a radiology suite and a pharmacokinetics unit.

Fields of research of the Institute will be pulmonology (respiratory medicine), allergology, occupational health with an emphasis upon the lung, infectious disease and, because of its synergies with allergies, occupational health and infections, a skin centre. Each unit will maintain its responsibilities and clinical services within the provincial health service, but its major research activities will be based in the Institute.

The new and bold element of the Lung Institute is that it will operate as a non-profit, financially self-sufficient public/private initiative. "With building costs covered by a major donation from Boehringer Ingelheim and some significant but smaller donations from other sources, the operating costs will be financed from research contracts and services provided by its staff," said Prof Bateman.

"It will thus not be dependent on either the university nor State, and surpluses will be employed for furthering the aims of the Institute."

Continued on page 7 →

LETTERS

The Editor

Following your appeal in the last paragraph of your editorial in the January/February issue, I hereby put pen to paper:

With respect to the CPD questionnaires appearing in the journal, I would like to congratulate the editorial committee for the assistance offered to medical practitioners to gain more CPD points. There are however several disconcerting features in the instructions, which are appended to the questionnaire. It requests that name and address details are correctly filled in, but there is no obvious space for such details to be completed. Neither is there any place for the edition of the respective journal to appear. It also asks for the correct answers to be marked with an X in the appropriate boxes, none of which are found and some questions requiring more than one answer, then run foul of the injunction to "not mark more than one answer". I appreciate that these are no more than niggles, but an improvement of the instructions would make it easier for all concerned.

My major reason however, for putting pen to paper, relates to the totally unacceptable situation with respect to WCA payments to doctors carrying out compensation work for the Commissioner. I am sure that I am not the only practitioner in the country whose book debt with the Compensation Commissioner is in excess of 80% at 150 days. This is totally unacceptable and in any other situation something would have been done to rectify the problem.

Continued on page 8

Continued from page 6

The Institute offers facilities for researchers and clinicians in these various disciplines to research common problems exploiting synergies of interest for collaborative research. Consultant services are offered in a range of clinical specialties in clinical epidemiological research, clinical drug trials, pharmacokinetic studies, pharmaco-economic research and in disease management programmes.

Training of specialists in community and occupational health, pulmonology, allergology, infectious diseases, internal medicine, paediatrics, and dermatology will be offered.

The Institute will provide specialised clinical services that are not available or are available to a limited degree within the academic hospitals, but that are needed for training of undergraduate and post-graduate students. The Institute will be accessible to patients who wish to consult experts in these areas of medicine.

Contact: Paddy Atwell
(012) 650-3741

LETTERS

Continued from page 7

Every Forum I visit, there is talk about getting something done with respect to improving the pay-out from the Compensation Commissioner's office, but to date absolutely nothing seems to be taking place. I wonder if other practitioners in the same situation could add their voice to mine in the hope that at least the occupational medical fraternity can unite to achieve payment for work, which I believe is being adequately done. I look forward to an overwhelming response from my colleagues.

Yours truly,

Dr L D Wilkinson
PO Box 499, Mandini, 4990

Editor's comment: *Thank you for your constructive criticism about the CPD questionnaire. We will certainly make the necessary amendments. We also had a few glitches in the questions initially, but hopefully these have now been ironed out. As far as payment for COID cases are concerned, this has now reached crisis point with certain specialists now refusing to treat WCA cases due to the long waiting period for payment. It does however go further in that occupational health nurses and doctors' receptionists cannot even access the offices telephonically and when they are lucky enough to get through, seldom are their queries answered.*

The Editor

Would it be possible through your magazine to debate and put to bed once and for all the dispute that seems to arise with NOSA audit staff and the OHN's about when one records an occupational disease such as noise induced hearing loss (NIHL) as a disabling incident?

NOSA is of the opinion that an occupational disease should be registered as a disabling incident in the month that the incident is submitted to the COID Commissioner.

I understand that the logistics would be much simpler if this is how it was done, but most of the occupational nurses out there will tell you that the Commissioner does not always accept these submissions. How does one go about de-listing this disabling incident? Often 12 to 15 months have elapsed before the Commissioner refutes the case.

Let's look at an ideal company with a zero DIFR at present. The Commissioner does not accept the NIHL incident that was submitted by that ideal company 15 months ago. Does that company now have a minus DIFR?

I realise that it is not easy for the auditor to monitor the recording of a disabling incident if one only records it once the Commissioner accepts the case, but COID usually sends a notification W.CI.55 acknowledging receipt of a claim and then a further notification W.CI.56 accepting liability for payment of benefits of that claim. Should the NOSA auditor not be looking for that documentation to verify the data?

Would NOSA like to explain their rationale behind the stance that they take?

Yours,

Jenny Edmonds
Haggie Jupiter Safety Department
PO Box 40072, Cleveland, 2022

Editor's comment: *This letter was forwarded to NOSA for their official comment. Although no reply has been received, the following was noted in Safety Management.*

Hannes Struyweg of NOSA Comments: Legislation requires all occupational incidents to be reported within specified periods. Hearing loss should be no different. The commissionaer has advised that less than two percent of all claims are rejected. The rejections bear iether on the Commissioner's criteria, being not work-related, or the employee not having worn PPE. Some 5 962 cases of occupational disease were reported in the last year.

The NOSA audit indicates how well employers manage their risks.

Noise induced hearing loss cases reported would indicate failure in the hearing conservation programme, with either training, engineering or admin measures or PPE. Medical surveillance should identify extra-mural causes.

NOSA has recommended hearing conservation programmes for three decades.

The question of delisting does not arise when a cut finger is reported as a DI. Hearing loss should be no different.

The NOSA executive users forum discussed the matter in June. The DIFR definition will reflect SH&E measurements separately.

The users also resolved to form a representative committee to assess the SH&E indicators which impact on the DIFR interpretation, including measurement level criteria. To participate, contact Hannes Struyweg at NOSA.

Hand Washing

THE SINGLE MOST IMPORTANT MEANS OF PREVENTING INFECTION

Infection control practices aim to prevent or reduce transmission of infections from a source (e.g. person, equipment, body fluids, etc.) to susceptible individuals. Since it is not always possible to identify those at risk of infection, standard precautions should be adopted for all patients, regardless of their diagnosis or presumed infection status. These standard precautions are adequate to prevent transmission of blood-borne pathogens. However, additional precautions should be taken when dealing with patients infected with organisms transmitted by contact, airborne or droplet routes of transmission. Hand washing is the single most important means of preventing infection. Effective hand washing helps remove or destroy micro-organisms on the hands, and helps prevent transmission of the micro-organisms and provides self-protection.

Social hand washing, i.e. using soap/detergent and water, removes some organisms from the skin but does not destroy them. The Global Consensus Conference on Infection Control Issues Related to Antimicrobial Resistance, now recommends that a hand wash product, such as Dettol Hygiene Liquid Wash, should be used to prevent transmission of micro-organisms in the following settings:

- Before and after handling food, feeding a patient and eating
- After visiting the toilet
- After dealing with used linen or waste
- Before and after nursing the patients (e.g. bathing, bedmaking)
- Whenever hands are soiled

Hygienic hand washing, i.e. using an antiseptic preparation to wash the hands, is a more effective way of removing and killing microbes. These preparations should be used:

- Before performing invasive procedures
- Before caring for susceptible patients (immunocompromised) and before entering a high risk area (e.g. burns unit)
- Before and after touching wounds or urethral catheters
- Before and after wearing gloves
- After contact with blood secretions, contaminated equipment or following situations in which microbial contamination is likely to occur.

Ideally, hand washing facilities (a designated hand wash basin with wrist operated mixer taps, warm running water, soap and disposable paper towels) should be available wherever health care activities take place (i.e. toilets, bathrooms, treatment rooms, ward, etc.) In the absence of paper towels, use a clean cloth.

In the absence of adequate hand washing facilities, an antiseptic product formulated for use without water, e.g. 70 % alcohol, should be used.

Dettol

In conclusion, simple infection control procedures, such as hand washing with Dettol Hygiene Liquid Wash, are inexpensive and effective to help prevent the transmission of serious pathogens.

B07610/2

The Burden of Occupational lung disease

Prof David Rees
National Centre for Occupational Health, Department of Health, Johannesburg

Occupational Health SA 2000, Vol 6, No 4, 10 - 14

Comprehensive information on occupational lung disease is not available for South Africa, and what is available underestimates disease burdens markedly; as is shown in this paper using mesothelioma as an example. Nevertheless, useful data is contained in compensation statistics, surveillance programmes and national registers. Due to under-reporting, the impact of occupational lung disease is better appreciated by examining specific issues: silica-related disease in gold miners and asbestos-related disease in mining communities are used in this paper. Finally, recommendations are made on improving information on the burden of occupational lung disease.

Introduction

Many occupational health practitioners would accept the contention that South Africa is experiencing an epidemic of occupational lung disease. We would be hard-pressed, however, to prove the case using the usual data-sources of compensation statistics, national disease registers and surveillance programmes. This is because our routinely collected data are characterised by gross under-reporting and difficulties in extracting formatted information from its curators.

Mesothelioma makes the point. How many new cases arise each year? A reasonable extrapolation from the Zwi incidence study would be at least 550, but this study relied largely on the recall of cases by diagnosing practitioners and incomplete case ascertainment was inevitable.[1] Relative to 550, what do the usual sources of information contribute?

South Africa's National Cancer Registry is an epidemiologic treasure, but cannot make up for under-reporting. *Table I* shows a declining number of reported histologically diagnosed mesotheliomas from 250 in 1992 to 150 in 1995 (the latest data).[2] Declining rates of mesothelioma are inconsistent with our history of asbestos production: the peak in both total asbestos and crocidolite (blue asbestos) occurred in the mid to late 70s.[3] The usual latent period of 30 to 40 years from first asbestos exposure to mesothelioma manifestation is compatible with a peak in the mesothelioma epidemic after 2005. Mesothelioma compensation data are not more reliable. Accepted at face value, they would show that we have a relatively minor mesothelioma problem: an average of 66 cases was submitted for compensation during 1994 to 1997.[4] SORDSA, although valuable for many reasons, not least in identifying hazardous occupations and industries, shows the greatest under-reporting: 39 and 15 cases were registered in 1997 and 1998 respectively. What these data-sources reveal is a significant mismeasure of the extent of the problem; a real concern in an environment of competition for shrinking resources.

Compensation and surveillance data

Compensation statistics and surveillance programmes are traditionally rich sources of data on occupational lung disease rates. Despite the limitations discussed above, valuable information can be obtained from these data sources.

Compensation statistics

Mining and related work

Occupational lung disease certifications in living miners obtained from recent, unofficial annual reports of the Medical Bureau for Occupational Disease (MBOD - the certification authority for mining-related disease) are summarised in *Table II and Table III.*

Table I Mesothelioma cases reported to the National Cancer Registry (NCR[a]), Compensation Commissioners[b] and SORDSA[c]

	1992	1993	1994	1995	1996	1997	1998
NCR	250	207	142	150			
Compensation Commissioners		34	78	81	69		
SORDSA						39	15

[a] Sitas, et al., 1998
[b] Rees et al., 1999
[c] Survellance of Occupational Respiratory Disease South Africa, NCOH, Johannesburg.

Table II New and upgraded certification of occupational lung disease in living miners

	1995/6	1996/7	1997/8
Tuberculosis only	5275	3565	Not available
Pneumoconiosis (with PTB)[a]	2115 (299)	3104 (450)	4982 (1036)
Obstructive airways disease (with PTB)[a]	319 (70)	232 (111)	182 (204)
Platinum salt sensitivity	17	44	20

Note: data are unofficial and may change.
[a]An additional number of cases had the condition plus tuberculosis. Total cases certified is, therefore, the sum.

Table III Type of pneumoconiosis certified in living miners

	1995/6	1996/7	1997/8
Silicosis	1314	1066	1996
Coal workers' pneumoconiosis	9	12	19
ARPD[a]	458	1287	2044
Asbestosis[b]	264	1148	1858

[a]ARPD = asbestos related pleural disease.
[b]Asbestosis = interstitial disease alone + interstitial disease with pleural changes.

Notable features are the relative paucity of coal workers' pneumoconiosis (employment in coal mining has been about 90 000 per year) and the increase in asbestos-related certifications.

A valuable new source of information is the Pathology Division Report: demographic data and disease rates: 1997.[5] This report, the first in a planned series, presents autopsy data from 3208 deceased miners examined at the National Centre for Occupational Health (NCOH) in 1997. About 85% of current and former white miners who die and about 85% of black miners who die in service come to autopsy, making this a unique data set. A few features from this comprehensive report are that active tuberculosis was present in 14.5% of cases (an increase from 7% in 1992); 481cases (15%) had silicosis. Rates were particularly high in black miners and increased with increasing age: 20% at 40 - 49 years; 28% at 50 - 59 years; and 30% at 60 - 69%. There were six cases of coal workers' pneumoconiosis in 143 coal miners, a rate of 4.2%.

Non-mining

Compensation submissions to the Compensation Commissioner, Compensation for Occupational Injuries and Disease Act, 1993 (COIDAct) are presented in *Table IV*. Data was obtained from the Commissioner's Report for the period to 31 January 1998. It should be noted that these are submitted, not accepted claims.

Surveillance data (SORDSA)

SORDSA is the voluntary reporting of occupational lung disease to a register at the National Centre for Occupational Health (NCOH) in partnership with the South African Pulmonology Society (SAPS), South African Society of Occupational Medicine (SASOM) and South African Society of Occupational Health Nurses (SASOHN).[6] SORDSA is supported by the WHO/SA Technical Cooperation Programme. Details of the 3559 cases reported in 1997 and 1998 are available from the SORDSA office and are not presented here. SORDSA data is valuable in part because they identify risk occupations and industries: *Table V* shows the industries in which occupational asthma arose in 1997 and most of 1998. A glance at the table confirms that we have a wide-spread occupational asthma problem; the corollary is that preventing occupational asthma requires effort from almost all industries.

Silica-related disease

The compensation and surveillance data show that thousands of new cases of occupational lung disease are diagnosed each year - yet does not capture the true extent and nature of these diseases in South Africa. Silica-related disease in gold miners and asbestos disease in mining communities are better measures. Although gold mining is used here because data is available, there is no reason to believe that the situation is not similar for silica-exposed industrial workers.

Silica-related disease in gold miners

In the 1990s, lung disease in gold miners has re-emerged as a national issue because research has shown:

· A large burden of undetected lung disease in former miners now residing in labour-sending areas [7,8]

· That silicosis is common in gold miners and that the attendant tuberculosis risk is serious [9,10,11]

Table IV Non-mining lung disease cases submitted to the Compensation Commissioner, COIDAct

	1995	1996	1997
Asbestos + silicosis[a]	392	283	250
Tuberculosis	348	205	231
Occupational Asthma	256	141	184
Byssinosis	Not available	Not available	11

COIDAct = Compensation for Occupational Injuries and Diseases Act, 1993.
[a]Pleural disease and pneumoconiosis are collapsed into this category by the Commissioner.

· That silica dust, independent of silicosis, increases the risk of tuberculosis[12,13]

In addition, the interactions between HIV, pulmonary tuberculosis and silicosis have further blurred the distinction between work and non-work related disease. Artefactual boundaries between workplace and community risks may hinder the effective delivery of health services.[14]

Pneumoconiosis

Two groups of former gold miners living in labour-sending areas have been investigated for pneumoconiosis - the results have caused a great deal of concern. Steen and co-workers reported a prevalence of 26 to 31% in former miners in Thamanga village, Botswana, and Trapido et al., 22 - 37% in Libode, Eastern Cape.[7,8] Generalising these rates to an estimated two million former miners now living throughout Southern Africa produces an astonishing 480 000 cases of pneumoconiosis (and 226 000 cases of tuberculosis attributable to work, with R9 961 million owing in compensation).[15]

Silicosis and tuberculosis

Analyses of secular trends in autopsy diagnosed silicosis and tuberculosis for 1975 to 1991 are disturbing as they show increasing prevalences for both silicosis (9.3% to 12.8%) and tuberculosis (0.9% to 3.9%).[10] Labour stabilisation resulting in longer service and older workers is an important factor. The risk of silicosis was investigated in 2 235 white gold miners who had, on average, 24 years service from 1940 to the early 1970s and were followed up to 1991. Fourteen percent had silicosis and the cumulative risk in the most exposed reached 77%.[9]

If silicosis were an innocuous disease these high rates would not be of great concern, but the strong association between silicosis and tuberculosis in South Africa combined with the HIV epidemic, makes the situation alarming.

Cowie found an increasing incidence of tuberculosis with increasing severity of silicosis: 1% per annum in men without silicosis; 2.2% in men with mild silicosis; 2.9% with moderate silicosis; and 6.3% with advanced silicosis.[11]

Cowie suggested that one quarter of his subjects with silicosis will have developed tuberculosis by 60 years of age.

Recent studies have shown that it is not only silicosis, but silica dust itself that confers an increased risk of tuberculosis and that this increased risk persists even after silica dust exposure ends; a finding with profound implications for the medical surveillance of former silica-exposed workers.[12,13] As Campbell and Williams have summarised, the interactions between high rates of silicosis, HIV infection and tuberculosis will require a more holistic approach to health and illness by workplace-based health services.[14] Fundamental to dealing with the alarming situation is adequate control of silica dust. There is little evidence that this is taking place: estimated quartz concentrations (the common form of silica) were derived for 48 underground gold-mining operations based on over 26 000 dust measurements taken during 1995 to 1997 - only 8 of the 48 locations had all quartz concentrations below the widely used standard of 0.1 mg/m^3 *(Table VI)*.[16] Data for non-mining industry is relatively scarce but what we have points to a similar failure of dust control. For example, only 24% of foundries responding to a postal questionnaire actually measured dust and an uncontrolled dust hazard was evident in all foundries surveyed between 1983 and 1992.[17]

Lowering of dust levels in all silica industries is urgently required to prevent an increase in the burden of lung disease.

Table VI Estimated quartz concentrations in 48 gold mining locations.

Quartz concentration	Number of mines[a]	%
All concentrations < 0.1mg/m^3	8	17
Some concentrations Between 0.1-0.4mg/m^3 but none > 0.4mg/m^3	21	43
Some concentrations > 0.4mg/m^3	19	40
	48	100

[a] Mines are either mines or shafts.

Asbestos-exposed communities

The recent National Asbestos Summit was an expression of a resurgence in concern about asbestos and health. Recent research findings show that these concerns are well founded:

Table V Occupational asthma reported to SORDSA during 1997 and January - November 1998 by industry and frequency

Industry	Frequency	Percent
Health Care	48	25.1%
Motor	24	12.6%
Refinery	18	9.4%
Foam and Plastic	10	5.2%
Baking	8	4.2%
Food	6	3.1%
General	6	3.1%
Mining	5	2.6%
Textile	5	2.6%
Grain milling	5	2.6%
Engineering	5	2.6%
Leather	5	2.6%
Building and Roadworks	4	2.1%
Paint	4	2.1%
Chemical	3	1.6%
Agriculture	3	1.6%
Railways	3	1.6%
Refrigeration	3	1.6%
Resin	3	1.6%
Welding	3	1.6%
Platinum	3	1.6%
Animal feeds	2	1%
Education/research	2	1%
Printing	2	1%
Metal	1	0.5%
Municipal service	1	0.5%
Cosmetic	1	0.5%
Iron and Steel	1	0.5%
Match	1	0.5%
Mineral research	1	0.5%
Shipping	1	0.5%
Unknown	1	0.5%
Acrylics	1	0.5%
Galvanising	1	0.5%
Shoe manufacture	1	0.5%
Total	191	100%

The Northern Province

Felix assessed the impact of asbestos mining on Mafefe, a group of villages in the Northern Province where mining of amosite (brown asbestos) and Transvaal crocidolite (blue asbestos) occurred from the 1920s to the early 1980s.[18] In a random sample of 681 adults the prevalence of asbestos-related pleural disease was 41%, with 34% of those with only environmental exposure affected. Ten percent of adults had "extensive bilateral disease that could cause lung function impairment.[11] Such extensive disease is not limited to Mafefe, and, provided practitioners submit cases, compensation payments to affected individuals would lead to a very significant inflow of money into a very poor part of South Africa - a point stressed by Davies.[19]

The Northern Cape: Prieska

Prieska, a small town in the Northern Cape crocidolite asbestos fields, is the focus of a number of projects. A birth cohort of 2 390 subjects born between 1917 and 1937 is being followed to ascertain the cause of death (using death certificates). The latest update is to 1995. 1 776 subjects have been traced of whom 633 have died, 27 of mesothelioma. In subjects 25 years or older the proportion of mesothelioma deaths is 27/419 i.e. 6.4% of this Prieska cohort who died older than 25 years has died of what is considered a rare tumour [Personal communication. Kielkowski, NCOH, 1999]. As the cohort ages, the rates are expected to increase.

In 1998, residents of Prieska and surrounds who thought that they might have asbestos-related disease were invited to an medical evaluation done by the Pulmonology Department of Johannesburg Hospital in 1998 . Nine hundred and fifty five individuals were seen. Five hundred and twenty four had had occupational exposure and 270 of them had asbestos-related disease, the overwhelming majority pleural. Thirty-five people had asbestos-related pleural disease but no occupational exposure. One case of environmental asbestosis was diagnosed [Personal communication. Hopley M, Johannesburg 1999].

Environmental mesothelioma

Mesothelioma due to environmental exposure is unusual except in South Africa, where about 20% of cases are induced by this exposure. Environmental cases are not eligible for workers' compensation, but the majority of "environmental" cases are due to localised industrial activity and not general pollution, due to decades of widespread asbestos use. In other words an attributable workplace can often be identified. For example, in 22 South African cases of environmental mesothelioma nine had lived near a mine, mill or store of asbestos, six had lived with a relative who worked on an asbestos mine (dust on clothes contaminated the home) and information was missing on one, so only six could recall no source of asbestos exposure (other than having spent time in mining districts).[4]

This pattern is also found elsewhere. Wittenoom, Australia, is the only place outside South Africa where crocidolite mining occurred. By 1993, 27 cases of mesothelioma had been identified in Wittenoom residents who had not worked with asbestos (i.e. environmental cases); 24 of the 27 had lived with an asbestos worker.[20] The point is that in most cases of environmental mesothelioma an attributable source of asbestos is identifiable; a factor which should change our approach to financial compensation.

Conclusion

This article makes the case that occupational lung disease is a significant public health issue, but hard evidence for this contention is patchy as the true extent of these diseases is not revealed by the usual data sources of compensation statistics and surveillance programmes.

More research, surveillance and case-finding activities are needed, and the data that is gathered by state agencies need to be put to better use. Topics for research might include: confirming the burden of occupational lung disease in former gold miners; defining the relationship between silica exposure and tuberculosis more precisely (at what levels of dust or cumulative exposure does tuberculosis risk increase?); why is dust control poor when the risk is so well known? (For example, is it simply that dust control is seen to be unaffordable or is it a perception that dust diseases are innocuous?) It is costly and difficult to maintain comprehensive surveillance of all occupational lung diseases so consideration should be given to sentinel diseases: incident silicosis in non-mining industry; occupational asthma; and mesothelioma in the Northern Cape and North West Provinces have appeal. Periodic surveys of dust levels and disease in a selection of key industries across the country are required to overcome poor case ascertainment and reporting. Besides mining, the ceramic and foundry industries would be logical sites for surveys. Compensation and enforcement agencies need to appreciate the value of the data they curate, and thus publish them more quickly and comprehensively, and make data sets available to researchers as a matter of course. (It should be noted that both the Departments of Labour and Minerals and Energy are aware of this issue and are improving data management.)

To do these fairly modest things will nevertheless take research funding and resources. Systems similar to those adopted by SIMRAC and SIMHEATH are needed to fund research and surveillance in non-mining industry, and the provincial occupational health units recommended by the "Abdullah" committee on Occupational Health in 1996 would go a long way in providing the capacity to do the surveys and case-finding.

References

1. **Zwi et al.** Mesothelioma in South Africa, 1974-84: Incidence and case characteristics. *Int J Epidemiol 1989;18:320-329.*
2. **Sitas F, Madhoo J, Wessie J.** Incidence of histologically diagnosed cancer in South Africa 1993-1995. Johannesburg:*National Cancer Registry, SAIMR, 1998.*
3. **Harington JS, McGlashan ND.** South African asbestos: production, exports, and destinations, 1959-1993. *Am J Ind Med 1998;33:321-326.*
4. **Rees D, Myers JE, Goodman K, Fourie E, Blignuat C, Chapman R, Bachmann MO.** Case-control study of mesothelioma in South Africa. *Am J Ind Med 1999;35:231-232.*
5. **Murray J, Hnizdo E, Coetzee L.** Pathology Division Report: Demographic Data And Diseases rates: *1997. Johannesburg: NCOH, 1999.*
6. **Hnizdo E, Rees D.** Surveillance of occupational diseases-where does SORDSA fit in? *Occupational Health SA 1997;3:26-31.*
7. **Steen TW, Gyi KM, White NW, Gabosianelwe T, Ludick S, Mazonde GN, Mabongo N, Ncube M, Monare N, Ehrlich R, Schierhout G.** Prevalence of occupational lung disease among Botswana men formerly employed in the South African mining industry. *Occup Environ Med. 1997;54:19-26.*
8. **Trapido AS, Mqoqi NP, Williams BG, White NW, Solomon A, Goode RH, Macheke CM, Davies AJ, Panther C.** Prevalence of occupational lung disease in a random sample of former mineworkers, Libode district, Eastern Cape Province, SA. *Amer J Ind Med 1998;34:305-313.*
9. **Hnizdo H, Sluis-Cremer GK.** Risk of silicosis in a cohort of white South African gold miners. *Am J Ind Med 1993;24:447-547.*
10. **Murray J, Kielkowski D, Reid P.** Occupational disease trends in black South African gold miners. *Am J Respir Crit Care Med 1996;153:706-710.*
11. **Cowie RL.** The epidemiology of tuberculosis in gold miners with silicosis. *Am J Respir Care Med 1994;150:1460-1462.*
12. **Kleinschmidt I, Churchyard G.** Variation in incidences of tuberculosis in subgroups of South Africa gold miners. *Occup Environ Med. 1997;54:636-641.*
13. **Hnizdo E, Murray J.** Risk of pulmonary tubercolosis relative to silicosis and exposure to silica dust in South africa gold miners. *Occup Environ Med 1998;55:496-502.*
14. **Campbell CM, Williams BG.** Managing diseases on the goldmines. *Southern African JPublic Health 1998;88:789794.*
15. **Trapido A, Goode R, White NW.** Costs of occupational lung diesease in South African gold mining. Journal of Mineral Policy, *Business and Environmental Raw Materials Report 1998;13:26-33.*
16. **Rees D, Kielkowski D, Lowe R, Nokwe N, Lebudi K.** A report on occupational health indicators for South Africa. Johannesburg: NCOH, 1999.
17. **Rees D, Weiner.** Dust and pneumoconiosis in the South Africa foundry industry. *S Afr Med J 1994,84:851-855.*
18. **Felix MA.** Environmental asbestos and respiratory disease in South Africa. Johannesburg : *Witwatersrand University, 1997.*
19. **Davies JCA.** A report on the Maandagshoek project - second programme April-September 1998. *Johannesburg, 1999.*
20. **Hansen J, de Klerk NH, Musk AW, Hobbs MST.** Environmental Exposure to Crocidolite and Mesothelioma. *Am J Respir Crit Med. 1998;157:69-75.*

Chronic Diseases Rehabilitation Programme - Mondi Paper, Durban

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Despite the increasing awareness in work-site lifestyle management programmes, little attention has been payed to specific rehabilitation programmes for chronic disease patients at the workplace. The main focus of this programme was to determine the effect of a supervised exercise and lifestyle education programme on chronic disease patients in an industrial setting. All patients were medically and physiologically tested on a number of parameters, before entering the supervised exercise programme. After attendance was excellent as a result of personalised exercise supervision and lifestyle management programmes which included not only physical activity, but also advice on other aspects of personal health, including: nutrition, weight loss, low back pain, smoking cessation, stress management etc.

The data collected demonstrated significant differences between pre and post intervention. Serum lipids and fitness scores were amongst the best changes that occurred. The big challenge for this programme is to sustain the long-term interest and enthusiasm among these patients.

Introduction

In recent years there has been increasing interest in maintaining and improving occupational fitness and promoting healthy lifestyle habits at companies in South Africa.

There is a large body of scientific knowledge that supports the prescription and rehabilitation of the workforce in improving work output, job satisfaction and company productivity.[1,2,3,4,8] Primary care providers are in an excellent position to encourage patients to become more active. It is important for the healthcare clinics to develop an understanding of the benefits of regular physical activity. A study by Knutsson et al. showed that there was an increased risk of ischaemic heart disease in shift-workers in a paper-mill in Sweden.[5] Mondi has a large component of their staff as shift workers, hence, the importance of the chronic disease rehabilitation programme established in March 1997. The biokinetic clinic was established primarily to provide a facility for the retardation and then improvement of disease states through exercise and lifestyle education, hence the purpose of the study. The results of this programme will be discussed.

Study description

The programme demands that each patient be assessed by the healthcare team, an exercise programme prescribed by a biokineticist and followed by supervised exercise training at least three days per week. Only patients with chronic diseases such as diabetes, hypertension, coronary artery disease, lower back pain, obesity, respiratory ailments or hyperlipaemics are eligible to enrol for this programme. Patients are re-assessed after being six months in the programme. The number of lower back pain patients and those with respiratory ailments were too few to report on. This is a free service to all chronic disease patients at Mondi. Patients attend the supervised exercise programmes, in their own time, usually before work (6-8am), during lunchtime (12-2pm) or after work (4-6pm), every other day. The drop-out rates were zero because of the personalised, supervised care of each patient by the biokineticist. This was the view of the patients. The cost of testing and the initial set up of the health and fitness centre was funded from the health clinic budget. The cost of the blood tests were part of the medical aid cost of each patient. This initiative forms part of the employee assistance programme offered by Mondi to their chronic disease patients.

Table I: Distribution of chronic diseases

	Patients (No.)	Patients (%)
Diabetes	12	34
Hyperlipaemics	15	44
Hypertensive patients	8	22

Table II: Pre-post exercise and lifestyle intervention results for thirty five patients

Prior to joining exercise programme

Patterns	Before	After 6 months	Percentage Improvement
Physically inactive:	65%	0%	100% ↑
Work-related stress:	70%	25%	64% ↓
Home-related stress:	25%	25%	0% →
Poor dietary habits:	75%	40%	46% ↓
Medicated for illness:	62%	43%	30% ↓
Cost of medication:	R4186,89	R2455,54	41% ↓
Doctor's visitations: (No.)	3	1.7	55% ↓
Sick leave (No. days)	10	5	50% ↓

Methods and materials

The patients were recruited via a letter of invitation from the clinic sister who had access to the medical records of all patients working at Mondi. All those patients that responded were included in this study as this was an exercise and lifestyle programme for chronic disease patients. Thirty five subjects volunteered for this pilot study. There were twelve non-insulin diabetic patients, 15 hyperlipaemic and eight hypertensive patients, *(Table I)*.

All patients indicated their understanding of the exercise and lifestyle programme, thereafter provided their written consent to participate in the study.

Before patients are accepted into the programme they are assessed by company doctors, cardiologists or their own general practitioners.

Thereafter, they are evaluated according to a number of components which include the following: stress at work and at home, medication usage, genetic disease patterns, lipid profiles, physical activity levels, dietary patterns, hypokinetic disease states, selected fitness components, including the percentage body fat and waist to hip ratio.

Stress levels at work and at home was measured on a rating scale from one to five, with one being no stress to five being very high levels of stress. This was a subjective assessment based on the patient's evaluation.

The dietary habits, smoking patterns and incidence of family history of heart disease was obtained via interview sessions with the patients.

Table III: Pre-post means and percentage changes for fitness and lipid profiles for the total group

Fitness components	Before	After	Percentage change
Resting heart rate: (No.)	83	71	14,5 ↓
Aerobic capacity: (ml/kg/min.)	33,3	39	17,8 ↑
Flexibility: (cm.)	22	29	31,8 ↑
Waist-to-hip ratio: (cm.)	0,94	0,91	3,2 ↓
Percentage body fat: (%)	25,1	20,7	17,5 ↓
1 minute sit-ups: (No.)	11	25	127 ↑
1 minute push-ups: (No.)	12,6	20,6	47,6 ↑
Grip strength: (kg.)	83,3	88	6,3 ↑
Weight: (kg.)	83	80	3,6 ↓
Lipid Profile	**Before**	**After**	**Percentage change**
Total cholesterol: (mmol/l)	6,5	5,8	10,7 ↓
HDL-cholesterol: (mmol/l)	1,07	1,19	11,2 ↑
Total cholesterol to HDL-C ratio	6,12	4,93	19,4 ↓
LDL-cholesterol: (mmol/l)	3,8	3,4	10,5 ↓
Triglycerides: (mmol/l)	3,03	2,3	30 ↓
Glucose: (mmol/l)	8,06	6,36	21,1 ↓

Table IV: Results of pre-post test fitness components (Mean (SD))

	Diabetics			Hyperlipaemics			Hypertensives		
Fitness components	**Pre-test**	**Post-test**	**% change**	**Pre-test**	**Post-test**	**% change**	**Pre-test**	**Post-test**	**% change**
Age (years)	46	47		49	50		48	49	
Weight (kg.)	79 (14,5)	77 (14,2)	2,5 ↓	84 (11,2)	81 (10,1)	3,5 ↓	88 (8,3)	82 (7,3)	6,8 ↓
Resting heart rate (no.):	79 (12,8)	68 (12,1)	13.9 ↓	86 (9,8)	76 (8,9)	11.6 ↓	84 (7,9)	70 (11,4)	16.7 ↓
Aerobic capacity (ml/kg/mm):	30 (8,3)	36 (6,3)	20 ↑	38 (5,6)	44 (5,4)	15.8 ↑	32 (4,09)	37 (3,7)	15.6 ↑
Flexibility (cm.):	23 (13,7)	29 (8,09)	26 ↑	25 (12,4)	35 (10,01)	40 ↑	18 (10,2)	23 (4,4)	27.8 ↑
Percent body fat (%)	23 (5,1)	19 (7,5)	17.3↓	25,7 (2,6)	20.6 (3,8)	19,8 ↓	26.6 (2,9)	22.6 (4,6)	15.0 ↓
Waist to hip ratio	0,96 (0,07)	0,93 (0,05)	3,1 ↓	0,93 (0,07)	0,92 (0,06)	1,0 ↓	0,95 (0,05)	0.90 (0,20)	5,2 ↓
One minute sit-ups (No.):	10 (11,6)	25 (7,5)	150 ↑	17 (10,6)	31 (8,1)	82 ↑	6 (6,0)	19 (3,2)	216 ↑
One minute push-ups (No.):	11 (8)	15 (10)	36 ↑	15 (6,11)	27 (10,2)	80 ↑	12 (7,5)	20 (6,51)	66.7 ↑
Grip strength (combined) (kg.):	75 (9,7)	79 (8,8)	5.3 ↑	94 (7,01)	99 (7,5)	5.3 ↑	81 (7,6)	86 (7,9)	6.2 ↑
Number of subjects	**12**	**12**		**15**	**15**	**15**	**8**	**8**	

The same questions were asked six months later.

Percent body fat was established using the three skin-fold site method and the waist to hip ratio was measured by the method of van Itallie (1988).[9,10] Muscular endurance was assessed using the one minute sit-up and push-up tests. Grip strength was measured using a hand grip dynamometer. The flexibility of lower back and hamstring muscles was evaluated employing the modified Wells and Dillon sit and reach test.[11]

All subjects fasted overnight before the blood tests were collected by the nurses at the Mondi clinic. They were then sent to the laboratory for analysis for serum lipids and glucose.

The cohort was followed longitudinally for six months and there was a retrospective analysis of various parameters as well as absenteeism and visits to their medical doctors, *(Tables II and III).*

Results

In this study patients were used as their own controls as this was an intervention study, so controls were not needed. There were thirty-five patients who were assessed after a six-month period. The composition of the diseases among the patients were as follows.

Only the results of single disease patients were selected for this study. No inferential statistics were undertaken because of the small sample size.

Work-related stress and dietary pattern changed by 64% and 46% respectively, based on the responses given by subjects relating to these components. An interesting finding was that 62% of the subjects were on medication at the commencement of the programme and this dropped by 30% after six months.

TABLE V: Results (fasting) Pre-post Test Profiles (mean (SD))

	Diabetics			Hyperlipaemics			Hypertensives		
Fitness components	**Pre-test**	**Post-test**	**% change**	**Pre-test**	**Post-test**	**% change**	**Pre-test**	**Post-test**	**% change**
Cholesterol (mmol/l)	5.6 (1,18)	5.6 (1,18)	0→	7.2 (1,12)	6.2 (1,25)	13.8↓	6.8 (0,91)	5.8 (0,64)	14.7↓
HDL-cholesterol (mmol/l)	.9 (0,08)	1.01 (0,11)	12↑	1.1 (0,44)	1.28 (0,38)	16.4↑	1.2 (0,33)	1.3 (0,27)	2.3↓
Total cholesterol to HDL-C ratio	6.2 (1,55)	5.5 (1,66)	11.3↓	6.5 (2,19)	4.8 (1,22)	26↓	5.7 (0,82)	4.5 (1,29)	21↓
LDL-cholesterol (mmol/l)	2.8 (,95)	2.8 (1,02)	0→	4.7 (1,08)	4.1 (1,26)	2.8↓	40 (0,74)	3,4 (.85)	15↓
Triglycerides (mmol/l)	3.3 (3,11)	3.2 (2,35)	3↓	3.6 (3,4)	1.9 (0,91)	47↓	3.0 (3,64)	1.8 (0,87)	40↓
Glucose (mmol/l)	12.1 (3.9)	7.8 (1,35)	35.5↓	6.3 (0,72)	5.8 (0,48)	7.9↓	5.8 (0,97)	5.5 (0,92)	5.1↓
No.of subjects	**12**	**12**		**15**	**15**	**15**	**8**	**8**	

There was a 41% decrease in the cost of medication, which showed an average individual monthly saving of R173,35 for the medical aid account which impacts positively on reduction on medical bills and reduced use of medication for chronic treatment. Doctor's visitations decreased from 3.8 per six months to 1.7. There was a 50% drop in sick leave taken from 10 days for the six-months period prior to the exercise programme to five days post-programme.

The body weight of patients dropped on average of three kilograms. They became leaner and fitter. There was a substantial decrease in percent body fat (17,5) within the total group. The overall fitness profiles improved significantly, with an average of 20% increases in most components. Aerobic fitness increased by 17,8 and that had a positive influence on work productivity. The patients indicated that they were able to work harder, longer and having better concentration levels throughout the day. The sleeping patterns of all the patients improved greatly, being more refreshed and relaxed on waking in the morning.

These changes definitely impacted positively on work output, which implies that Mondi benefited from the fitness and reduced absenteeism of these chronic diseased patients.

When all thirty-five subjects are grouped together, there was a 10,7% drop in cholesterol, with a 11,2% increase in HDL-C and a 10,5% decrease in LDL-C. There was a substantial reduction in coronary artery disease risk for these patients as measured by the total cholesterol to HDL-C ratio.

There was a 19,4% pre- to -post intervention positive change *(Table III)*.

When each group's results are examined separately *(Table V)*, the greatest changes occurred in the hyperlipaemic and hypertensive groups. Decreases of 13,8% and 14,7% were noted with respect to cholesterol, for the hyperlipaemic and hypertensive groups respectively, with the greatest differences from pre- to -post levels being in triglycerides. A decrease in the risk ratio by 11.3% was measured in the diabetic group which was a positive result, even though the cholesterol levels did not change substantially among these patients. There was a positive decrease in the waist to hip ratio in all three groups, which would impact on the reduction of risk to hypokinetic diseases.[9]

Further the diabetic's HDL-C profiles was enhanced by 12%. Overall a positive improvement for resting glucose levels which dropped from pre- to -post exercise in all groups with the higher percentage achieved in the diabetic patients *(Table V)*. All three groups showed positive fitness changes from pre to post intervention *(Table IV)*.

Conclusions

Many benefits were accrued for this cohort attending the rehabilitation and lifestyle management programme. Among others, the following were observed and reported:

- Improved quality of life and better management of work stress
- Decrease in anxiety and depression and improvement in social interaction

- The subjects become fitter and leaner
- The attitude to work, work productivity and absenteeism changed positively
- Their lipid profiles improved greatly
- There was an all-round improvement in fitness components
- There was a decrease in visits to doctors
- This programme also showed a better understanding of their respective disease conditions
- A lower medication bill on a monthly basis.

Recommendations

This study has explored the benefits of an on-site exercise and lifestyle programme for chronic disease patients, which demonstrated excellent results. However, further investigation is required whereby economic outcomes may be assessed for such a facility and the economic benefits for the patients and the company.

References

1. **Shephard, R.J.** Do work-site exercise and health programmes work? *The Physician and Sportsmedicine. 1999, February.*
2. **Shephard, R.J.** The economic benefits of enhanced fitness. Champaign, IL. *Human Kinetics Publishers, 1986.*
3. **Seward, B.L.** The corporate fitness to corporate wellness. *Fitness in Business, 1988, Vol. 3.*
4. **Bates, G; Bernard, T.E.; McClusky, H and Giekes, S.** The Industrial Worker. A different breed of athlete. *Sports Science Exchange. 1997, Vol.8 (2).*
5. **Knuttsson, A.; Jonsson, B.G.; Akerstedt, T. and Orth-Gomer, K.** Increased risk if ischaemic heart disease in shift workers, 1986. *The Lancet. July, 12.*
6. **Ostwald, S.K.** Changing employee's dietary and exercise practices: an experimental study in a small company. *Journal of Occupational Medicine, 1989, Vol.31 (2).*
7. **King, A.C.; Carl, F.; Birkel, L.; and Haskell, W.L.** Increasing exercise among blue collar employees: the tailoring of work-site programmes to meet specific needs, 1988, *Prev. Med. 17.*
8. **Roberts, M., and Harris, T.G.** Wellness at work. *Psychology Today. 1989: May 23(5).*
9. **Van Itallie, T.B.** Topographic of body fat: Relationships to Risk of Cardiovascular and other Diseases. In: Anthropometric standardization reference manual (Eds) Lohman, T.G.; Roche, A.F.; Martorell, R. Champaign, *Human Kinetics Publishers, 1988.*
10. **Pollock, M.L.; Schmidt, D.H. and Jackson, A.S.** Measurement of cardiorespiratory fitness and body composition in the clinical setting. 1980: *Comprehensive Therapy, 6: 12-27.*
11. **Golding, L.A.; Meyers, C.R.; and Sinning, W.E.** Y's way to Physical fitness. The complete guide to fitness testing and instruction (3rd Ed). *Champaign, Human Kinetics Publishers, 1989.*

Musculo-skeletal Symptoms of Female Cashiers in the Cape Peninsula, South Africa

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Introduction

Repetitive Strain Injuries (RSIs), Cumulative Trauma Disorders (CTDs) or overuse syndromes are some of the various terms used to describe the interactive motion of man and machine and the possible effects this may have on the human body. Countries like Australia and the United States have experienced a wave of interest in these disorders from the mid-eighties into the nineties.[1]

Relating pain of the upper limb to occupation has been done for almost 300 years, but the aetiology of these conditions remains controversial.[2]

Cashiers are at increased risk for developing upper limb disorders due to the nature of their work: standing, repetitive motions, awkward posture, etc. The prevalence of upper limb disorders in this workgroup is not well known for the South African environment, while their American and Scandinavian counterparts have been studied extensively.[3-13]

This pilot study was performed as part of the degree requirements for the MMed in Occupational Medicine at the National University of Singapore.
It was aimed at three levels:

- The prevalence of musculo-skeletal pain among the cashiers
- The problems identified by the management of the supermarket
- The workplace design

Methodology

Three leading supermarket chains were initially approached, but only one agreed to support the study. A total of 15 supermarket branches were randomly selected from their 45 existing branches in the Cape Peninsula area.

All female cashiers working at any one day, during the same shift, were to be included in the study sample, but only those working as a cashier for longer than six months would be eligible.
Two questionnaires were distributed:

- A self-administered questionnaire to record self-reported musculo-skeletal symptoms of the upper limb and back among the cashiers
- A questionnaire for the manager at each store.

Of the one hundred and thirty questionnaires distributed, a total of 117 completed questionnaires were returned. Twenty-one of the questionnaires had to be discarded: six due to incompleteness and 15 for not meeting the selection criteria of working as a cashier for a minimum period of six months.

No distinction was made between part-time and full-time workers, as the literature showed no evidence of differences in symptoms between the two groups.[9,14]

Software packages Excel (MS Office 97) and SPSS (Version 8.0) were used for analysis of the 96 valid responses.

Workplace assessments were performed to observe the difference in design between the laser scanning system versus the conventional cash register system. Two of the fifteen branches used laser-scanning devices and the rest used the conventional cash register.

Results

Bio-data of the cashiers

- The median age was 27 years, ranging from 17 to 59 years (N=92).
- The mean self-reported height was 1.6m (N=49). The mean weight was 67.3kg (n=76).
- Body mass index (BMI = weight/height^2 in kg/m^2) was calculated if both height and weight were indicated (n=44). See *Table I.*
- Only 7.5% of cashiers were left-handed (n=93).

Employment profile

. The number of years employed as a cashier by this employer ranged from one month to 20 years (4.6 years on average), while the mode (most frequently encountered value) was 0.8 years (9-10 months). (n=87)
The minimum time period working as a cashier was set at six months, therefore the time period working as a cashier ranged from six months to 21 years. The median time being a cashier was 3.8 years. (n=91) Time worked per week ranges from eight to 48 hours, with a median of 24 hours.

Table I: Body Mass Index (BMI) of female cashiers (n=44)

Grade	BMI Range	No	%
Normal	20-25	20	45.5
Grade 1 (overweight)	25-30	10	22.7
Grade 2	30-40	12	27.3
Grade 3	>40	2	4.5

This is due to the company policy of using casual labour, which limits shifts to 24 hours per week (three times an eight-hour shift).

Physical Activity

One third of the cashiers are involved in some form of physical exercise, while forty one percent had hobbies with less physical involvement like reading.

Health Indicators

The majority reported no underlying diseases (91.7%) and the diseases reported were: Gout (3), Diabetes Mellitus (1), Arthritis (1), Thyroid disease (1), and abnormal blood pressure (2). Only three workers had had relevant surgery and these included thumb and back operations. Two back injuries were reported and none had any physical deformities.

Musculo-skeletal complaints

The one-year period prevalence of pain in the neck and upper-limb is summarised in *Table II*. The frequency and intensity of pain was also considered. Shoulder pain was the biggest problem (26%) and of the seven left-handed cashiers, four suffered from shoulder pain (57%). To investigate if there was an association between shoulder pain and hand preference, a Fischer's exact test was performed as one cell had an expected frequency of less than five. No significant association was found (p=0.07).

Table II: One-year period prevalence of pain in neck and upper limb of female cashiers (N=96)

Body Part	No	%
Neck	22	23
Shoulder	25	26
Upper arm	4	4
Elbow	0	0
Fore-arm	2	2
Wrist	8	8
Hand	3	3

The cashiers with shoulder pain (25) were compared to those without (71) to establish any differences for bio-data. The group means were compared with t-tests for age, height, weight and BMI. There were no differences for age (p=0.71), height (p=0.23), weight (p=0.94), or BMI (p=0.62). The mean years working as a cashier also did not differ between the groups (p=0.54).

To investigate other risk factors that may contribute to shoulder pain, two risk factors associated with Carpal Tunnel Syndrome (CTS) in cashiers were chosen: obesity and time working as a cashier. As the median time working as a cashier was ± four years, the group was divided into those working for less than four years and those working four years or more. Neither years working as a cashier nor obesity showed an association with shoulder pain (p=0.68 and p=0.81 respectively).

The one-year period prevalence of pain in the back is summarised in *Table III*. Forty-eight cashiers experienced back pain in the past year, mostly in the lower back.

The point prevalence of musculo-skeletal pain is summarised in *Table IV*.

Medication

Twenty five women (26%) indicated that they take non-steroidal anti-inflammatory drugs for the pain and twenty have consulted a doctor for the pain (20.8%).

Absenteeism

Thirteen (13.5%) of the cashiers took leave for the pain in the past 12 months, of whom most took 2-3 days. All of these had back pain in the past year, five had shoulder pain, four had neck pain and four had wrist pain in combination with shoulder pain (2) or neck pain (2).

Seven managers identified absenteeism as a problem (47%) and the most common reasons for sick leave were headache and flu (53%) and domestic problems (47%). Musculo-skeletal complaints were not mentioned as a reason for sick leave.

Workplace design

Two different checkout-systems were evaluated, one for a conventional cash register and one for a laser scanning system. The workstation for both systems is manufactured from the same plan. The cashier sits on a stool facing forward. Only a few cashiers had their own packers, the rest would twist around on the static chair to reach for the plastic bags at the far end of the corner. Some stood up when bagging groceries. The absence of a conveyor belt to bring items into proximity leads to workers reaching to the end of the grocery queuing area.

Table III: One- year period prevalence of back pain (n=48)

Part of back	No	%
Upper back	21	43.8
Middle back	12	25.0
Lower back	26	54.2

The cash tray of the register is covered with a metal grid, apparently to prevent grab thieves. This forces the cashier to either enter codes with fore-arms in a static position above the grid, or reaching underneath the grid and typing with their wrists in 90° extension.

The stool has four legs with no footrest or ring. There is no back support and the height is not adjustable. Leg space under the counter is limited.

Changes suggested by cashiers

The majority of complaints involved the malfunctioning or the absence of the air-conditioner (22%) and their salary (22%). Twenty percent wanted to change their chairs, but did not specify which changes they had in mind. Inter-personal relations with management accounted for 20% of the complaints.

Management

Apart from absenteeism, staff turnover was a problem in six of the 15 branches (40%). Percentage turnover ranged from 20-60%. Other problems were inadequate training and the majority of managers (67%) suggested that more training should be a priority. They are in favour of appointing more permanent cashiers, as the majority of workers are casual employees. Casual labour, combined with high staff turnover, results in an impossible situation to train cashiers.

Medical services are available at seven (47%) of the branches for injuries on duty only, but no occupational health service with pre-placement or surveillance exists.

Discussion

Bio-data

The cashiers are a young group of workers and this may lead to underestimation of the problem. The mean height of 1.6m should be interpreted with caution due to small sample size (n=49) and for being self-reported. In previous studies in the Cape Peninsula, the mean height for the coloured and black female population was 1.56m and 1.58m respectively.[15,16] The mean weight was 67.3kg (n=76), close to the 65.8kg and 69.8kg for coloured and black females as earlier recorded.[15,16]

Table IV: Point prevalence of pain experienced by cashiers (N=96)

Body Part	No	%
Back	13	13.5
Neck	6	6.3
Shoulder	9	9.4
Upper arm	1	1.0
Elbow	0	0
Fore-arm	0	0
Wrist	1	1.0
Hand	1	1.0

Of the 96 women, only 49 entered their height, while 76 recorded their weight. Only 44 entered both values (45.8%). More than half of these women can be classified as overweight or obese, with only 30% participating in any physical activity. This is also an important ergonomic consideration when designing the chair and workstation.

Although no significant association was found between hand preference and shoulder pain, this could have been due to small sample size. More than half (57%) of the left-handed cashiers endured shoulder pain - this may be due to overuse of the left hand and arm for entering and passing items with the same hand.

Hand preference has been shown as a significant risk factor for the development of upper extremity cumulative disorders.[17]

Musculo-skeletal pain

Shoulder and neck pain were the two dominant areas of concern (26% and 23% respectively). Pain in the wrist, fore-arm and hand combined is 13.5%, indicating a possible prevalence of CTS symptoms. Morgenstern et al reported a 12% prevalence in a similar study in California.[12]

Back pain is experienced by half of the women, of which lower back-pain (54.2%), is the most prevalent source of pain. This is consistent with similar cashier studies in Australia.[14] However, the prevalence of back-pain is still much lower than reported by Ayoub for the same mid-twenties group in which up to 90% of American cashiers complained of back-pain.[3]

The point prevalence of pain at the time of the survey was lower than that of the past year, but the order remained the same:

1. Back-pain
2. Shoulder-pain
3. Neck-pain

Recommendations

The Cashiers

- Improved and more frequent training
- Health education focusing on healthy lifestyle and back-care

The workstation

- Ergonomic alteration to both check-out stand and chair
- Removal of metal grid over cash tray

The Management

- Opening of active communication channels between cashiers, supervisors and store-managers
- Reviewing company policy of casual employment

Conclusion

The cashiers

The low prevalence of pain in this study population was expected: these women endure many other constraints and issues like safe transport and childcare often take priority over workplace conditions. None of them had any other employment and they are desperate to keep their jobs. Pain is accepted as part of daily living in difficult socio-economic times and compared to other hardships they endure, is not the most important issue to them. The complexity of pain tolerance and the willingness to report it has been described by numerous authors, concluding that it is strongly influenced by psychosocial, cultural and economic factors.[18]

The workplace

Although there are numerous deficiencies in the workplace design, cashiers do not seem to attribute their symptoms to their work or workstation design. Work practices will have to change along with the design - implying an appropriate training intervention.

The management

Communication among the levels of management is just as important as between management and workers for any successful intervention.

South Africa's wave of interest in upper limb disorders seem to be out of phase with the international tidal wave that has swept many developed countries. Future economic evolution will change this situation and the need will arise for a pro-active approach, which is suitable for local conditions.

Limitations of the study

The study was limited by the lack of a comparison group, the cross-sectional design and the small sample size of 96.

Values were self-reported and not confirmed by testing or measurement. Future studies could compare different supermarket designs and practices, including physical examination. The best training method to change cashiers' behaviour is especially worth investigating.

References

1. **Ireland DCR.** Australian Repetition Strain Injury Phenomenon. *Clin Orthop 1998; 351:63-73.*
2. **Buckle PW.** Work factors and upper limb disorders. *BMJ 1997; 315:1360-1363.*
3. **Ayoub MA.** Ergonomic Deficiencies: I. Pain at Work. *J Occup Med 1990; 32:52-57.*
4. **Baron SL, Habes D.** Occupational musculo-skeletal disorders among supermarket cashiers. *Scand J Work Environ Health 1992; 18 (suppl. 2): 127-129.*
5. **Grant KA, Habes DJ.** An analysis of scanning postures among grocery cashiers and its relationship to checkstand design. *Ergonomics 1995; 38:2078-2090.*
6. **Harber P, Peña L, Bland G, et al.** Upper Extremity Symptoms in Supermarket Workers. *Am J Ind Med 1992; 22:873-884.*
7. **Harber P, Bloswick D, Peña L, et al.** The Ergonomic Checker Motions and Cumulative Trauma Risk. *J Occup Med 1992; 35:805-811.*
8. ***Harber P, Bloswick D, Beck J, et al.*** Supermarket Checker Motions and Cumulative Trauma Risk. *J Occup Med 1993; 35:805-811.*
9. ***Hinnen U, Läubli T, Guggenbühl U, et al.*** Design of checkout systems including laser scanners for sitting work posture. *Scand J Work Environ Health 1992; 18:186-194.*
10. **Lannersten L, Harms-Ringdahl K.** Neck and shoulder muscle activity during work with different cash register systems. *Ergonomics 1990; 33: 49-65.*
11. **Margolis W, Kraus JF.** The Prevalence of Carpal Tunnel Syndrome symptoms in female supermarket checkers. *J Occup Med 1987; 29:953-956.*
12. **Morgenstern H, Kelsh M, Krauss J, et al.** A Cross-Sectional Study of Hand/Wrist Symptoms in Female Grocery Checkers. *Am J Ind Med (1991):20: 209-218.*
13. **Osorio AM, Ames RG, Jones J, et al.** Carpal Tunnel Syndrome Among Grocery Store Workers. *Am J Ind Med 1994; 25: 229-245.*
14. **Ryan GA.** The Prevalence of musculo-skeletal symptoms in supermarket workers. Ergonomics 1989; 32: 359-371.
15. **Steyn K, Fourie J, Rossouw JE, et al.** Anthropometric profile of the coloured population of the Cape Peninsula. *SAMJ 1990; 78(2): 68-72.*
16. **Steyn K, Bourne L, Jooste P, et al.** Anthropometric profile of a black population of the Cape Peninsula in South Africa. *East Afr Med J 1998; 75(1): 35-40.*
17. **Kucera JD, Robins TG.** Relationship of Cumulative Trauma Disorders of the Upper Extremity to Degree of Hand Preference. *J Occup Med 1989; 31:17-22.*
18. **Armstrong TJ, Buckle P, Fine LJ, et al.** A conceptual model for work-related neck and upper-limb musculo-skeletal disorders. *Scand J Work Environ Health 1993; 19(2): 73-84.*

Managing know-how for behavioural change

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Introduction

This Paper provides a strategy for building the know-how needed to enable employees to change behaviour, improve occupational safety and work towards destigmatising HIV.

In the struggle to change human behaviour, improve occupational safety and health; and work towards preventing the transmission of HIV, industry has thus far focused on:

- Safety awareness (and AIDS awareness) campaigns
- Education and training
- The dissemination of statistics

This approach centres on the transfer of 'information' and fails to elicit the internal desire needed to create behaviour changes as permanent life changes. Therefore, in spite of industry's efforts to improve safety and health, people continue to perform unsafe acts, have accidents, are injured and are infected with HIV.

This is evidenced by the 33.8% rate of increase in the prevalence level of HIV infection since 1997, recorded in the 1998 National HIV Survey of pregnant women in South Africa. It is also evidenced by the losses experienced in industry due to unsafe practices, poor housekeeping, accidents and incidents which are often due to difficulties experienced in resolving problems and anticipating and preventing mistakes.

In view of the above, consider the time, effort and money being wasted on awareness campaigns, training and the dissemination of statistics. Consider the potential future costs in terms of human suffering, if this problem is not addressed.

To put occupational safety and health on a new footing, new and innovative approaches to changing behaviour and mindset must be sought.

Instead of merely managing 'information', what is required is to enable current initiatives by building capacity for acquisition and transfer of know-how. In addition to building know-how, the education process must elicit an internal desire to create the behaviour changes as life changes.

What is know-how?

'Know-how' resides in the mind of the individual. It embraces the cognitive thinking that underpins an individual's capability to use information to acquire knowledge and to assess risks. It includes the thinking relating to knowledge of 'what', knowledge and skill of 'how' and knowledge of the problem-solving and action-planning steps to follow to deal with problems, avoid mistakes and prevent accidents.

Knowledge versus information

Using the analogy of the 'information' conveyed by traffic lights, Ermine illustrates the differences between information and knowledge.[1] Ermine proposes that motorists need to 'know' only three things to interpret the 'information' conveyed.

On the surface, the lights convey three simple messages. Green means 'go', orange means 'caution, the light will change' and red means 'stop'. Yet, the complexity of the messages received, and the impact on driver behaviour, is awesome.

Utilising know-how gained through experience, a driver seeing a green light from a distance may slow down, predicting that the light will change before he arrives. Another driver may decide to speed up to pre-empt having to stop when the light changes to red.

Driver behaviour and the capacity to pre-empt having an accident, are dependent on each individual driver's know-how gained through experience and the cognitive thinking steps followed in assessing the possibilities or risks before arriving at a decision.

Similarly, each individual's decision on whether or not to wear a condom, will depend on that individual's capacity to visualise the outcomes of his/her actions as these unfold in time, and the willingness to take risks.

Managing the acquisition and transfer of know-how has significant benefits. It enhances employee confidence and self-esteem, improves relationships, and motivates employees to want to work safely and take on greater responsibility.

The following methodology for managing the acquisition and transfer of safety and health-related know-how is put forward as part of a holistic approach to managing occupational safety and health.

A methodology for transferring know-how

The first step is to obtain buy-in and ensure alignment is achieved. Employees at all levels learn how to apply their skills in critical thinking and conceptualisation required to:

- establish a common understanding of values that underpin maintenance of safety and health;
- translate these values into everyday actions that demonstrate commitment to safe behaviour;
- critically evaluate values that lead to unsafe behaviour.

The transfer of know-how is achieved through the implementation of a planned programme of education and training. This includes developing the skills in critical thinking, reasoning and problem-solving needed to do the following:

- Establish a standard in the mind of what is required to maintain safety and health (For example, always use required safety equipment; always carry condoms and have safe sex.)
- Visualise the sequence of events as these unfold over time, in the event of non-compliance to requirements. (For example the impact over time of transmitting HIV to a partner.)
- Analyse potential problems, plan ahead to prevent mistakes/accidents and arrive at appropriate conclusions on action to pre-empt disaster.

Through this process new patterns of thinking and communication will be established. As people acquire know-how, positive changes in behaviour and a willingness to accept responsibility and accountability will emerge.

Some results achieved

At a company that manufactures pre-stressed concrete sleepers a steady decline in accident frequency rates, improved labour efficiencies and a steady decline in reject rates from 4% of production to less than 1% of production were recorded.[2]

In the Renal Unit at a State Hospital, improved patient compliance to treatment, a reduction in incidents of peritonitis and improved relationships between patients and medical staff were recorded after nursing staff were trained on how to transfer their treatment-related know-how to patients.[3]

At a Gold Mine, positive employee attitudes, a reduction in accidents and incidents and improvements in productivity were recorded. The mine as a whole doubled production in two years.[4]

At a Cosmetic Manufacturing Company, the air and surface sampling reports indicated significant improvements in hygiene and cleanliness. No further losses due to contamination of product as a result of human error were recorded during the 12-month period after project implementation. An improvement of 36.9% in plant efficiency and 19.6% in line efficiency were recorded by the Industrial Engineer.[5]

The methodology utilised for managing the transfer of know-how is effective in changing behaviour and improving safety, quality and productivity in every organisation that employs people and every industry.

Case Study

AEL is a South African organisation involved in the manufacture, distribution and marketing of explosives. AEL's products and services are sold throughout Africa.

To achieve excellence through people and productivity, the organisation has embarked on a number of people development initiatives, including a 'Leadership Philosophy' that focuses on 'care and growth' for every employee.

In November 1998, as part of a holistic approach to achieving change and transformation, a development project was implemented in the Distribution Section at AEL's Modderfontein Site near Johannesburg.

The project aimed to establish whether a behaviour change at shop-floor level could be achieved through managing the transfer of task-related technical know-how.

Over the next 12 months, as Team members acquired the know-how needed to pre-empt problems and meet job and safety requirements without error, positive changes in behaviour and attitudes emerged.

Team members started to be pro-active in their thinking and were willing to put in additional effort to meet job and customer requirements. Instead of informing management (after the event) of problems to resolve on their behalf, team leaders started to advise management of potential problems to be aware of, with suggested solutions.

Significant improvements in stock accuracy, housekeeping and safety were recorded.

In September 1999, a pilot project was implemented in the Accessories Section, to establish whether the methodology for changing behaviour and mindset would be effective in enabling employees to work towards destigmatising HIV/AIDS.

The development programme included ten training sessions provided over a three-month period.

Through the process of developing the participants' skills in analysis, critical thinking and reasoning, the participants were enabled to:

- critically evaluate their own perceptions and attitudes towards HIV/AIDS

- confront their fears of being infected with HIV and perceive the need to accept and assist people infected with HIV.

Building on this foundation through the process of developing skills in problem-solving and action-planning, participants were provided with the 'thinking tools' needed to:

- deal with HIV-related problems
- perceive the need to take control of their personal lifestyle
  - maintain safe sexual practices and avoid being infected with HIV
  - be tested voluntarily to facilitate early diagnosis
  - maintain physical and mental health after being infected with HIV in order to stay healthy, pre vent transmitting HIV and prevent being re-infected with HIV.

Lessons Learned

- Developing reasoning skills needed to enable people to deal with HIV-related problems; and educating people on action to take to maintain physical and mental health after being infected with HIV, is as important in preventing the transmission of HIV as educating people on how to prevent being infected with HIV.
- Positive attitudes emerge and there is a greater willingness to accept and assist others who are infected with HIV when people develop the skills in critical thinking and reasoning needed to enable them to perceive that by leading a healthy lifestyle and maintain ing safe sexual practices, one can maintain physical and mental health after being infected with HIV.
- Fear of maybe having contracted HIV, and the stigma attached to being infected is not effective in causing people to change their sexual practices.
  Fear causes people to:
  - go into a state of 'denial' that is reflected in resistance to attending a training programme on HIV/AIDS and resistance to the use of condoms.
  - avoid being tested to establish their HIV status.

  It is only after people have developed the skills in critical thinking needed to enable them to distinguish between fact and opinion; and the reasoning skills that underpin the capacity to confront their fears and deal with HIV/AIDS-related problems; that attitudes towards HIV change from 'denial' to a desire to take control of their lifestyle and establish what their own HIV status is in order to prevent being infected (or re-infected) with HIV.
- Changing attitudes towards HIV/AIDS required to de-stigmatise HIV/AIDS is a slow process.
- Unless the entire workforce is exposed to cognitive development, the process will not be effective in de-stigmatising HIV/AIDS. The participants will perceive that other employees (who have not been exposed to critical thinking) will be prejudiced and therefore, they will be reluctant to go for testing and will continue to hide their HIV status.
- The development programme should be included as part of an existing training programme, for example:
  - Leadership training (problem solving and action planning)
  - Safety training
  - Induction training
- To reinforce and consolidate the learning and sustain the behaviour change after training has been provided, a support group should be established for employees with family members or friends who have contracted HIV/AIDS. Monthly meetings should include on the Agenda, items of interest relating to health, dealing with personal problems, and so on.

References

1. **Ermine J.L.** (1996) Les Systemes de Connaissances. *Hermes, Paris.*
2. **Clur B** (1997) Developing Cognitive Thinking Capacity - The Key to Improving Productivity and Quality of Life in the 21st Century. *Paper presented at the 10th World Productivity Congress, Santiago, Chile*
3. **Clur B** (1999) Managing the Acquisition and Transfer of Know-How - A Strategy for Achieving Excellence Through People and Productivity. *Paper presented at the World X1 Productivity Congress, Edinburgh, UK*
4. **Clur B and Templeton L** (l995) Cognitive Skills Development - The Key to the Success of Organisational Change Initiatives. *Paper presented at the l995 Conference on Organisational Change and Renewal, Johannesburg South Africa*
5. **Clur B** (1998) Building cognitive thinking capacity for knowledge utilization. *Paper presented at the 1998 IMS Summer School, Cambridge, UK*

DEPARTMENT OF HEALTH

SORDSA NEWS

WHO/SA Technical Cooperation Programme

Surveillance of Work-Related and Occupational Respiratory Diseases in South Africa

Volume 4, No. 1 January – June 2000

IN THIS ISSUE

- SORDSA reporting results
- Inhalation accidents
- Establishing exposure to a known cause in suspect cases of occupational asthma.

EDITORIAL

Welcome to another issue of SORDSA News, the first in this new Century which has brought a few changes for the better. We have several new members on the SORDSA team from NCOH. Drs Belinda Dias and Spo Kgalomono are new additions to NCOH's occupational medicine section and already actively involved in SORDSA activites. Dr Dias has contributed an article on a problematic aspect in occupational asthma diagnosis to this issue, using examples of NCOH cases. We are also very pleased to have Ms Thoko Duma, who has joined SORDSA as the new database administrator. Many of the reporting members have probably had an introductory telephone call from her, as well as a polite reminder to submit reporting forms!

The reporting books for this year were sent out in early January. It has come to our attention that many of the books did not reach their destinations, partly due to incorrect address information. I would like to appeal to you to ***please inform us of any changes in your contact information*** in order to save us both time and money with correspondence in the future.

I hope that this reporting year will be most successful ever, and that we will continue to achieve great results. I would like to thank all of you who are faithfully reporting your cases to SORDSA, to welcome all our new members, and to stress that information provided by you is extremely useful and we intend to use it to the best of our ability to target prevention and intervention programmes. For the good of occupational health in South Africa, we need your continued interest and participation.

Tonya Esterhuizen, SORDSA manager and SORDSA News Editor

SORDSA REPORTING RESULTS

October 1996 to December 1999

In the last quarter of 1999 reporting members have increased from 342 to 393, however, the Northern Province, Northern Cape, North West Province, Mpumalanga and Free State still have less than 20 reporting members each.

In 1999, 518 new cases were reported to SORDSA, 77 in the last quarter. This is less than 25% of the cases reported during 1998 (2482 cases), and we feel this is a decrease in reporting rather than a decrease in incidence. To attempt to rectify this situation, we are aiming for 100% reporting this year, and we would like to encourage and remind all reporting members to submit their monthly forms to SORDSA, even if you do not have any new cases to report. The following table shows the frequencies of cases reported by disease group in 1999 and in total.

Table 1: Frequencies of cases reported to SORDSA

Disease	1999	Total (1997-1999)
Inhalation accidents	177	351
Pneumoconiosis	122	2265
COPD	45	86
Occupational asthma with latency	38	249
Tuberculosis	29	135
Bronchitis	24	70
Non malignant pleural disease	21	130
Latex allergy	16	69
Pneumoconiosis and TB	14	283
Irritant induced asthma	14	75
Rhinitis	6	35
Byssinosis	5	19
Lung cancer	3	28
Mesothelioma	2	57
COPD and pneumoconiosis	1	227
Other	1	23
Irritant reaction	0	24
Total	**518**	**4126**

Pneumoconiosis is still overall the most frequently reported occupational lung disease in South Africa. In the UK, the SWORD surveillance system has consistently found occupational asthma to be the most frequently diagnosed occupational lung disease (27%), with pneumoconiosis third at 7% of the cases (1).

The industries reported to SORDSA for short and long latency diseases are shown in Table 2.

Table 2: Industries for SORDSA cases (1997 – 1999)

Industry	Short latency diseases	Long latency diseases	Total	
			N	%
Mining and quarrying	62	2494	2556	62.1
Paper and pulp	219	3	222	5.4
Asbestos industry	1	204	205	5.0
Iron and steel	22	141	163	4.0
Other	113	40	153	3.7
Health care	152	0	152	3.7
Building and roadworks	31	93	124	3.0
Chemical	94	3	97	2.4
Food, baking, grain milling, animal feeds	65	5	70	1.7
Refining	62	5	67	1.6
Foundry	17	46	63	1.5
Power industry	3	42	45	1.1
Motor industry	30	10	40	1.0
Vanadium and other metal	11	18	29	0.7
Textile industry	28	0	28	0.7
Foam and plastic	21	1	22	0.5
Aluminium production	20	0	20	0.5
Engineering	8	9	17	0.4
Railways	5	11	15	0.4
Ceramic	2	12	15	0.4
Paint	12	2	14	0.3
Total	**978**	**3139**	**4117**	**100**

The most commonly reported industry for short latency diseases is paper and pulp, followed by health care and the chemical industry. Reports to the SWORD scheme in the UK have indicated that health care generated most short latency disease cases in 1998, followed by food manufacture and the chemical industry (1).

Reference:

1. Meyer JD, Holt DL, Cherry NM, McDonald JC. SWORD '98: Surveillance of work-related and occupational respiratory disease in the UK. *Occup Med* 1999; 485-489.

INHALATION ACCIDENTS

In the last issue (Volume 3, No.3) we presented information on the industries, occupations and suspected agents for occupational asthma cases reported to SORDSA. In this issue, inhalation accidents are highlighted.

Inhalation accidents have emerged recently as an important occupational respiratory condition according to SORDSA's results, becoming the second most frequently reported condition overall and the most frequently reported short latency disease, with 8.5% of SORDSA's cases overall. The agents and industries responsible for inhalation accidents notified to SORDSA until December 1999 are shown below. Sulphur dioxide and chlorine were the most frequently reported causative agents for this condition, and the vast majority of cases were reported from the paper and pulp industry, followed by the chemical industry.

Table 3: Causative agents reported for inhalation accident cases

Agent	Frequency	Percent
Sulphur dioxide	184	52.4
Chlorine	82	23.4
Other	21	6.0
Unknown	17	4.8
Other chemicals	11	3.1
Pesticides	7	2.0
General dust	7	2.0
Hydrogen sulphide	5	1.4
Carbon monoxide	5	1.4
Combustion products	4	1.1
Ammonia	4	1.1
Anhydrides	4	1.1
Total	**351**	**100**

Table 4: Industry for inhalation accident cases

Industry	Frequency	Percent
Paper and pulp	214	61.0
Chemical industry	84	23.9
Other	17	4.8
Platinum refining	13	3.7
Metal, iron and steel	7	2.0
Pesticide industry	6	1.7
Shipping industry	5	1.4
Foam and plastics	5	1.4
Total	**351**	**100**

Inhalation accidents reported to the UK surveillance system, SWORD, took a prominent position from 1993. In 1998 they constituted 7.0% of cases reported to SWORD and were the second most commonly reported short latency illness (1, 2). The main agents responsible for inhalation injury cases reported to SWORD were anaesthetic gasses (11.1%), acids and caustic (10.8%) and solvents (8.6%) (2). SORDSA's results showed that sulphur dioxide was the most common agent for inhalation injuries reported in South Africa, causing 52.4% of the cases. In the UK, health care (25.2%), motor vehicle manufacture ((10.2%), chemical manufacture (7.8%) and rubber and plastics manufacture (4.3%) were important industries for this condition during 1998 (2). This is contrasted with SORDSA's results where the majority of cases occurred in the paper and pulp industry (61.0%). These discrepancies probably reflect gaps in SORDSA's reporting coverage, since the vast majority of these cases were reported by one source only. Nevertheless, since inhalation accidents can lead to asthma development (3), this points to a specific problem which should be investigated.

References:

1. Ross D. Ten years of the SWORD project. *Clin Exper Allergy* 1999;29:750-753.
2. 2. Meyer J, Holt D, Cherry N, McDonald J. SWORD '98: Surveillance of work-related and occupational respiratory diseases in the UK. *Occup Med* 1999;49:485-489.
3. Ross D, McDonald JC. Asthma following inhalation accidents reported to the SWORD project. *Ann Occup Hyg* 1996;40:645-650.

ESTABLISHING EXPOSURE TO A RECOGNISED CAUSE IN SUSPECT CASES OF OCCUPATIONAL ASTHMA

Belinda Dias and David Rees

Asthma caused by work (occupational asthma) is being diagnosed with increasing frequency. Deciding whether a worker has the disease or not is important, but often quite difficult.

Usually identification of the specific causative agent is necessary for a confident diagnosis of occupational asthma and it is important for compensation purposes. The Occupational Medicine Clinic of the NCOH investigated 46 workers for occupational asthma in 1999. Some of them are listed in Table 1 (page 4) by industry and major reported exposures. These reported exposures are influenced by the insight of the patient and the degree to which the doctors investigated the workplace.

Reading through Table 1 makes the case clearly that establishing exposure to a recognised cause is sometimes straight forward. If the patient has asthma and there is a temporal relation between exposure and work, then making the diagnosis is not difficult; for example cases 5 and 6.

Table 1 also shows it is not always easy to confirm or refute exposure to an asthma-causing agent. Not infrequently a worker is exposed to a mixture of agents, some that aggravate pre-existing asthma and other that cause it, for example cases 9, 10, 12 and 14. New causes are being "established" all the time, further complicating the matter.

The whole process of evaluating exposure is time consuming and co-operation of the employer and patient has to be obtained. Often a hazard evaluation of the workplace is required. Evaluation of exposure often needs an up-to-date and accessible database of causes of occupational asthma, familiarity with work processes and associated exposures, and often the expertise of an occupational hygienist or chemist is needed.

There is a need for specialised units to attend to suspect cases of occupational asthma, which supports initiatives in most provinces to establish occupational health units.

Table 1. Patients referred to the NCOH Clinic for the investigation of occupational asthma in 1999.

No.	Industry	Occupation/Process	Agent
1	Motor vehicle	Spray painter	Epoxy amine, isocyanates
2	Printing	Prepares cylinders for cylinder bath	Calcium carbonate, dorstan, sulphuric acid, cyanide solution, toluene, zinc chloride
3	Motor vehicle	Cleans car parts	Aluminium fumes, caustic soda, chemond 200
4	Tobacco	Machine operator	Alcohol, acetone, ethanol, ethylene acetate, benzene, phosphoric acid, caustic soda, tobacco dust
5	Motor vehicle	Spray painter	Isocyanates
6	Health	ICU nurse	Latex
7	Security	Security officer at an electronic manufacturer	Fire at work exposed to: polyvinyl chloride, resins, pyrolysis products
8	Food	Preparing salads	Onions, garlic, lettuce, tomatoes, celery, spinach, baby marrow
9	Radiator	Torchman	Lead, latex gloves, brass, soldering fumes, zinc chloride
10	Construction	Welder	Coal, asbestos, welding fume- aluminium and stainless steel
11	Steel	Plating, painting and fitter	Zinc, chrome, tin, nickel, brass, copper, cadmium, welding fume
12	Foundry	Manager	Manganese, formaldehyde, coal dust, hexane, silica, bentonite, alpha-quartz, heat and fumes
13	Construction	Laboratory assistant	Cement, toluene, acid fume – HCl
14	Furniture	Cutting chipboard	Wood dust, chipboard, formaldehyde
15	Cosmetic	Compounder	Talcum, silica, NaOH, nitric acid, formaldehyde, HCl, NH_3, ethyl acetate, acetone, toluene, pigments

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CPD QUESTIONNAIRE

1. **Pain of the upper limb due to occupation is an old problem, but the specific aetiology remains controversial.**
   A - True B - False

2. **Cashiers working part-time experience less musculo-skeletal symptoms than those working full-time.**
   A - True B - False

3. **Lower back pain was the most common area of pain for the cashiers who experience back pain:**
   A - True B - False

4. **Shoulder pain was the most prevalent source of pain in the upper limb for the cashiers during a one-year period:**
   A - True B - False

5. **The majority of cashiers complained about the design of the check-out point**
   A - True B - False

6. **Choose the correct answer: Which shift workers are more prone to Ischaemic Heart Disease?**
   A - night shift workers only B - day shift workers only
   C - shift workers in general D - no research exists to
   E - all of the above support this question

7. **In the diabetic group, the total cholesterol levels improved post-test.**
   A - true B - false

8. **A significant challenge is to sustain the long-term interest and enthusiasm among this cohort of patients.**
   A - true B - false

9. **Which answer is correct: The group's average decrease in total cholesterol was:**
   A - 10,7% B - 11,2%
   C - 15% D - 22%
   E - 94%

10. **Indicate the right answer: The benefits of a regular work-site physical activity programmes are:**
    A - lowered stress levels B - greater work capacity
    C - lower medication bills D - fewer doctor's visits
    E - all of the above

11. **Choose the correct explanation why HIV/AIDS awareness campaigns have not been effective in changing behaviour towards the disease:**
    A - people don't want to change their sexual behaviour
    B - people are ignorant
    C - awareness campaigns focus on the transfer of information. This fails to transfer the HIV/AIDS-related know-how that underpins the capacity to change behaviour.
    D - awareness campaigns do not provide sufficient information about HIV/AIDS to enable people to change their behaviour
    E - all of the above

12. **What is "Know-how"**
    A - the integration of knowledge and skill gained through experience.
    B - a form of knowledge recorded in books and manuals
    C - all available information on a subject
    D - a form of knowledge recorded on the internet
    E - all of the above

13. **The education process need not elicit an internal desire to create the behaviour changes as life changes.**
    A - true B - false

14. **In any behavioural change, the first step is to obtain buy-in.**
    A - true B - false

15. **How is the transfer of know-how achieved?**
    A - through the implementation of a planned programme of education and in-house discussions of key issues
    B - through study
    C - through completing multiple-choice questions
    D - through a performance management system
    E - all of the above

16. **South Africa's mesothelioma epidemic:**
    A - reached its peak decades ago
    B - reached its peak in the 1990s
    C - will peak after 2005
    D - is largely due to chrysotile mining
    E - is well-defined because we know how many cases arise each year

17. **Lung disease in gold miners has re-emerged as a national issue because:**
    A - silicosis is common in gold miners and the attendant tuberculosis risk is serious
    B - silica dust independent of silicosis increases the risk of TB
    C - research has shown that there is a large burden of undetected lung disease in former miners now resident in labour-sending areas
    D - all of the above E - None of the above

18. **Occupational asthma reported to SORDSA has not been seen in which industry:**
    A - health care B - Motor
    C - fishing D - Resin
    E - Metal

19. **Which statement concerning asbestos is correct:**
    A - 64% of a random sample of Mafefe, Northern Province adults had asbestos-related pleural disease
    B - Prieska is a small chrysotile mining town in Mpumalanga province
    C - 20% of South African mesothelioma cases are environmental
    D - South Africa is the only country to have mined crocidolite
    E - environmental mesothelioma is usually from general background asbestos pollution

20. **Which topic for research suggested by the author is correct?**
    A - identifying causes of hypersensitivity
    B - defining the rate of cigarette smoking in coal miners
    C - Confirming the burden of occupational lung disease in former gold miners
    D - measuring the dust level in gold mines
    E - searching for non-asbestos causes of mesothelioma

Instructions

1. Read the articles in the journal to find the answers to the questions
2. Make sure that your name and HPCSA number 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. Results are recorded by SASOM and a certificate will be issued at the end of each year.

Ergonomics Sites

A considerable amount of useful ergonomics information can be rapidly obtained via the Internet. This eighth NetPage provides a listing of sites selected from the Ergonomics page of ASOSH.ORG (located via Societies & Related at World Links). Further links can be obtained via the Courses, Online Training, and Products (online journals) pages. The foreign language web sites can be viewed in English via the Alta Vista Babel Fish Translator at World Links. Health Physics and Industrial Psychology will be covered in the next two issues of the NetPage. We look forward to your comments and links for the NetPage and ASOSH.ORG.

Company
Carpal Tunnel Syndrome Page (http://www.netaxs.com/~iris/cts/welcome.html) Excellence Internet Services, USA
CTDNews (http://www.ctdnews.com/) LRP Publications, USA. Information on cumulative trauma disorder (CTDs) injuries and workplace repetitive stress injuries, from carpal tunnel syndrome to low back pain
Ergonomics at Work (http://www.combo.com/ergo/index.html) Allscan Distributors Inc, Canada
Ergonomics in Australia (http://www.ergonomics.com.au/) Mark Dohrmann and Partners Pty Ltd. Useful links to further ergonomics information (http://www.ergonomics.com.au/ergolinks.htm)
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Ergoworld (http://www.interface-analysis.com/ergoworld/) Interface Analysis Associates, USA
Healthy Computing (http://www.pc.ibm.com/ww/healthycomputing/index.html) IBM, USA
Healthy Computing Guide (http://www.microsoft.com/products/hardware/ergo/) Microsoft, USA
Human Factors & Ergonomics (http://www.usernomics.com/hf.html) Usernomics, USA
Office Ergonomics (http://www.office-ergo.com/) F-One Ergonomics, USA. Contains office ergonomics information aimed at ergonomics committee members as well as office workers in general
Office Ergonomics Self-Help (http://www.3m.com/cws/selfhelp/index.html) 3M, USA
Resource Library (http://www.rmis.com/cd/mcerg.htm) Risk Management Internet Services (RMIS), USA
Safety and comfort guide (http://www.compaq.com/comfortguide/index.html) Compaq, USA
WorkSpace Resources (http://www.workspace-resources.com/) WorkSpace Resources, USA
Government and Public Service
Bad Human Factor Designs (http://www.baddesigns.com/) USA. A scrapbook of illustrated examples of things that are hard to use because they do not follow human factors principles
CTD Resource Network, Inc. (CTDRN) (http://www.ctdrn.org/) USA. A California nonprofit corporation providing information and assistance to the repetitive strain injury (RSI) community Typing Injury FAQ (TIFAQ) (http://www.tifaq.org/)
Ergonomics (http://www.ccohs.ca/resources/ergonomi.html) CCOHS, Canada
Ergonomics (http://www.osha-slc.gov/SLTC/ergonomics/) OSHA, USA
Ergonomics/Human factors (http://oshweb.me.tut.fi/cgi-bin/wilma.pl/erghf) OHSWEB, Finland
Ergonomics.org (http://ergonomics.org/) Dedicated to the exchange of information between the fields of ergonomics and the Alexander Technique

Essentials: Manual Handling **(http://www1.safetyline.wa.gov.au/sub27.htm)** SafetyLine, WorkSafe Western Australia
Institut de recherche en santé et en sécurité du travail du Quebéc (IRSST) **(http://www.irsst.qc.ca/indexe.htm)** Quebec Occupational Health and Safety Research Institute
Manual Handling brochures **(http://www.maqohsc.sa.gov.au/Publications/publications.html)** Mining and Quarrying Occupational Health and Safety Committee (MAQOHSC), Australia
NOHSC **(http://www.nohsc.gov.au/index.htm)** National Occupational Health & Safety Commission, Australia
Other WWW Sites Ergonomics, Human Factors and Musculoskeletal **(http://www.cdc.gov/niosh/ergoweb.html)** NIOSH, USA
Patient Educational Materials **(http://www.sechrest.com/mmg/reflib/ctd.html)** Medical Multimedia Group, USA
RSI-UK **(http://www.rsi-uk.org.uk/)** UK. Self-help website
Society
All-Ukraine Ergonomics Association **(http://www.elan-ua.net/~vea/index_en.htm)**
Asociación de Ergonomía Argentina **(http://www.geocities.com/CapeCanaveral/6616/adea.html)**
Associação Brasileira de Ergonomia (ABERGO) **(http://abergo.pep.ufrj.br/)** Brazilian Association of Ergonomics
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Board of Certification in Professional Ergonomics (BCPE) **(http://www.bcpe.org/)** USA
Die Öesterreichische Arbeitsgemeinschaft für Ergonomie (ÖAE) **(http://ebweb.tuwien.ac.at/oeae/)** Austrian Working Group for Ergonomics
Ergonomics Society of South Africa (ESSA) **(http://www.rhodes.ac.za/academic/departments/hke/essa.htm)**
European Association of Cognitive Ergonomics (EACE) **(http://www.cs.vu.nl/~eace/index.html)**
Finsk Ergonomiförening (http://www.occuphealth.fi/org/ery/english.html) The Finnish Ergonomics Society
Gesellschaft für Arbeitswissenschaft e. V. (GfA) **(http://www.gfa-online.de/)** German Ergonomics Society
Human Factors and Ergonomics Society (HFES) **(http://www.hfes.org/)** USA Europe Chapter **(http://utopia.knoware.nl/users/hfesec/)** Netherlands
International Ergonomics Association (IEA) **(http://ergonomics-iea.org/)** IEA Federated Societies **(http://ergonomics-iea.org/iea/fede_societies.html)**
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The Ergonomics Society of Australia Inc (ESA) **(http://www.ergonomics.org.au/)**
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CUErgo (http://ergo.human.cornell.edu/) Cornell University Ergonomics Web, USA Information (http://ergo.human.cornell.edu/CUEHinfo.html)
CybErg (http://www.curtin.edu.au/conference/cyberg/) International cyberspace conferences on ergonomics, Curtin University of Technology, Australia
Groupe Ergonomie et Nouvelles Technologies (GENTE) (http://www.gente.ufrj.br/ingles/principal.htm) Ergonomics and New Technologies Group, Université Fédérale de Rio de Janeiro (UFRJ), Brazil Hot Links (http://www.gente.ufrj.br/hotlinks.htm)
Human-Computer Interaction Resources on the Net (http://www.ida.liu.se/~miker/hci/) Linköpings universitet, Sweden
Human Kinetics and Ergonomics (http://www.rhodes.ac.za/academic/departments/hke/) Rhodes University, South Africa Ergonomics in Southern Africa: From principles to practice (http://www.occuphealth.fi/e/info/anl/297/scott.htm) African Newsletter 2/1997, Finland Industrially Developing Countries Committee (IDCC) (http://www.ru.ac.za/hke/idcindex.html)
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Robin Burgess - Limerick's Pages (http://www.uq.edu.au/~hmrburge/) Department of Human Movement Studies, The University of Queensland, Australia

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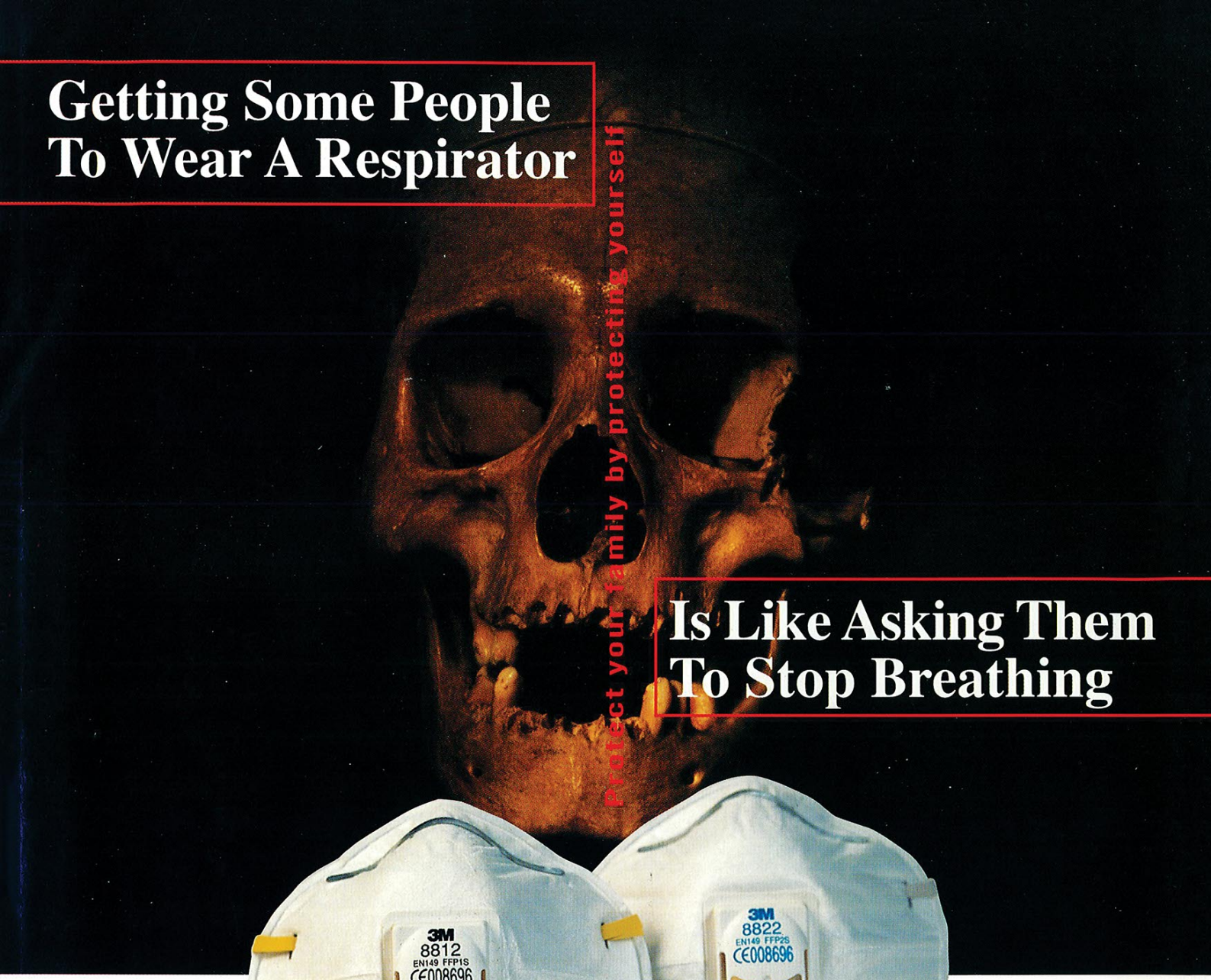

Is Like Asking Them To Stop Breathing

3M Has Changed All That

Working in harsh environments without a respirator can lead to long term health problems that can shorten your life. The problem is, of course, making a respirator that is easy and comfortable to wear.

The 3M 8812 and 8822 disposable dust respirators offer a lightweight design that is comfortable to wear.

Unique Valve

Cool Flow™ is a unique, patented exhalation valve which makes breathing through the respirators easier.

By dramatically reducing heat build-up, the respirators ensure cool, comfortable wearing even in hot, humid conditions, while at the same time providing effective protection against fine particles.

Use your respirator...it will save your life.

3M Occupational Health & Environmental Safety Division
Toll free: 0800 119 711

3M *Innovation*